UC-NRLF

\$B 264 496

SCHOOL JANITORS MOTHERS AND HEALTH

PUTNAM

SCHOOL JANITORS MOTHERS AND HEALTH

BY

HELEN C. PUTNAM, A.B., M.D.

OF THE COMMITTEE OF THE AMERICAN ACADEMY OF MEDICINE
ON THE TEACHING OF HYGIENE

*Health Habits educate
more than Health Maxims*

AMERICAN ACADEMY OF MEDICINE PRESS
EASTON, PA.

LB3405
P8

COPYRIGHT, 1913, BY HELEN C. PUTNAM
ALL RIGHTS RESERVED

PRINTED IN THE UNITED STATES OF AMERICA
PUBLISHT FEBRUARY, 1913

TO THE
LIBRARY OF
CONGRESS

**TO THE
AMERICAN ASSOCIATION FOR STUDY
AND PREVENTION OF INFANT
MORTALITY**

**THE SUREST PREVENTION ON THE LARGEST SCALE
IS TO DEVELOP THRU PUBLIC SCHOOLS POTENTIAL
FATHERS AND MOTHERS WITH WHOLESOME BODIES,
MINDS AND IDEALS**

259681

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

CONTENTS

	PAGE
AUTHOR'S NOTE	vii
KEY-WORD	ix
I. PREVENTION OF SCHOOL FATIGUE	
October: The air school children breathe at home	11
November: The air children breathe at school	21
December: Dirty children and fresh air	27
January: Internal cleanliness: carious teeth	32
February: Internal cleanliness: elimination of waste	37
March: What and when school children should eat	42
April: Muscular exercise an internal bath	48
May: Idleness, evenings, dress, and cigarettes	53
June: The Long Vacation	58
II. MOTHERS' CLUBS AND CLEAN SCHOOL-HOUSES	
November: Men as housekeepers	61
December: Cleaning floors	67
January: Cleaning lavatories—the common cup and towel—paper ones	75
February: Walls and windows	85
March: An interlude—open air schools	93
April: Streets and housecleaning	96
May: School housecleaning and social centers	104
III. SCHOOL JANITORS AND HEALTH	
October: A billion dollars and all our children	111

CONTENTS

	PAGE
November: The great test. The Boston A. C. A.	117
December: And Janitors' Rules.	124
January: And measuring window washing	128
February: And "dipping"	134
March: Another study of schoolrooms	142
April: Measuring health conditions	151
May: Dust again	163
June: How to do it	167
 IV. PRACTICAL ASPECTS OF BIOLOGIC SCIENCE IN SCHOOL ADMINISTRA- TION: THE PROBLEM OF JANITOR SERVICE	179
 V. THE TRAINING OF JANITORS IN SANI- TARY CARE OF SCHOOL PREMISES	189
 INDEX	195

AUTHOR'S NOTE

The main part of this little book appeared during 1909-1912 as serials in *Child-Welfare Magazine*, the organ of the National Congress of Mothers and Parent-Teacher Associations. They have been revised and several additions made for the purpose of increasing their usefulness; but the original mission is retained—a constructive appeal to organizations of mothers, the house-keepers, to fulfill their responsibility for children's well-being outside the walls of the family residence as well as inside. The serial form of publication makes repetition occasionally desirable. Some of this has been retained with the hope that the emphasis of a repeated idea may help produce results.

There are also two papers on related topics; one republisht from *Proceedings of the National Education Association*, the other from *Journal of the American Public Health Association*.

I wish to record here my gratitude to Dr. Charles McIntire, broad minded and generous secretary of the American Academy of Medicine which specializes in medical sociology, for his cooperation in issuing the volume.

H. C. P.

Quiapen
January 1, 1913

KEY-WORD

School is a part of life, not "preparation" only, and to practice pupils in standardizing details affecting health means improving our vital statistics—the measure of a nation's right living.

Page 170

I

PREVENTION OF SCHOOL FATIGUE

The child's right to be well cared for equals "the right to be well born"

October

We have provided schools and required by law or social custom twenty million children to enter them this month.

Nine months from now fifteen millions, more or less, will show various degrees of nervousness and pallor. The condition will be accompanied in many instances with other disorders.

This result of school life is called school fatigue. It is a hindrance in developing the best kind of citizens—either physically, or mentally and morally. It affects children's children, and is a factor in "race suicide" and race deterioration.

It is produced partly by lack of proper air, food, play and sleep; partly by neglected physical defects; partly, too, by unwise school work and unwise home or other outside occupations.

Evidently parents, educators, school boards and other city fathers are concerned, as are state and federal authorities. Our best hope lies in intelligent mothers with the will *and the power* to use their intelligence.

A mother can make no wiser plan for the coming nine months than to concentrate on preventing school fatigue in her own children; after them, in the children of the less fortunate, whose ill health reacts on her own either directly or in direct ways. Children need healthy playmates and school companions in a healthy community. Some of the work required can be successful only by combined effort of many mothers, of mothers and teachers, of both parents and school board; or other branches of the municipal government may need to cooperate.

The air school children breathe at home

We have nearly learned the lesson we must all eventually learn, that open air is essential to steady nerves and good health. We are proving daily that tuberculosis, nervous exhaustion (weariness, irritability, sleeplessness), most catarrhal conditions (of which we find so much among children), pneumonia, several contagious diseases and many surgical cases, all improve with "open air" treatment more satisfactorily—open air and a few other items of cleanliness. Even adenoid

conditions are frequently found to disappear when city children are removed to open country living.

The air that children have in schoolrooms is often such many medical inspectors, school nurses and teachers have told me that when they begin their duties in autumn they have irritated throats and other bad feelings until they "get used to it." Children have this air for four, five or six hours daily. The mother must look first to "making up for it" so far as possible by the right conditions out of school; and next, to improving the air in schools.

Odors of cooking, laundering, sleeping rooms and the like should be blown out. Whether or not there is any chemical harm in "smells," they are often accompanied with dust having its pus germs and occasionally, especially in dwellings, disease bacteria. Probably smells offend good taste because race experience has found them very often an index of disease and unhygienic conditions, filth-bred insects, mildew and stagnation. Offensive odors may even produce nausea. The mental depression and irritation from them disturbs health as well. They always mean that the house is not properly ventilated.

Dust, too high temperatures and dryness are the commonest faults in indoor air at home. A fourth fault is something we have no good name for—a lack of "tone" or "vitality" or stimulus, some unknown quality or qualities that refresh

and "wake us up" when we throw open windows and draw long breaths of outdoor air. On cold winter days when sometimes the heat "doesn't heat," by opening the house for a minute's swift flushing with outside air we find ourselves warmer and entirely comfortable soon after.

Some have offered in explanation of this delightful quality of open air that it is due to oxygen in larger quantities, or to ozone. Others claim an influence from radium, the interesting discovery for which Madame Curie has received the Nobel Prize. Radium exhibits a remarkable energy affecting objects in its vicinity, and the question is whether this influence from minute particles in the earth may not give to outdoor air some of its wholesome qualities; and whether there are not still other substances or forces, perhaps electric, as yet unknown that may do so. We have often thought a scientific problem solved, and later found there was more to it.

It is recently proved that a large part of the comfort in open air is due to its constant motion, much of which is cut off by the walls of the house. One of the attempts in ventilation now is to supply sufficient motion of the air for comfort and health, as well as sufficient humidity. Whatever the explanation (we shall come back to it again), there is very quickly a harmful difference between air shut up and air free, even when the room is as well dusted as possible and is not too warm.

The three objects, then, for mothers to work for at home are house air as free as possible from dust, never *above* 68° in temperature, and frequently renewed from out of doors. In addition, and this is important, they should have evaporation of water, just short of steam on windows in cold weather, to provide the humidity that in open air helps soothe and heal irritated respiratory passages. Or they may wish to measure the humidity with a wet-dry bulb thermometer as we shall see later is coming to be done in schools.

All the rooms in use should be kept at as near the same temperature as possible, for when the skin and the delicate lining of nose and throat are warm and flusht in a room of 68°, the sudden cold of another room, when such a change is frequently made, disturbs the circulation and its control by the nervous system to such a degree that often catarrh, a slight cold, or even slight muscular rheumatism follows.

Wise mothers are coming more and more to regulate rooms by thermometers, not by feelings. Feelings are extremely unreliable. We have for a long time allowed nurses and mothers to guess at the temperature of babies' bottles and baths by putting the finger in the milk or elbow in the water. Some measurements with thermometers have recently been made of actual temperatures after nurses have done their best with "feelings," and not once did they agree. The temperature

of babies' food is very important indeed. Even the cooling that goes on between the time the bottle is given the baby and the time he finishes it may make the difference between a well and an ill baby.

The temperature of the rooms at home is just as important to school children. I went into the library last night where my little sister had been quietly reading for an hour beside the light wood fire on the hearth to take off the first touch of October frostiness. "It is stifling here." "Why, I was just feeling shivery and wanting my scarf!" The thermometer read seventy-six. That is a universal experience, and a common—perhaps the commonest source of "colds," paving the way to tuberculosis. Thermometers should be kept steadily between 65° and 68°—lower rather than higher. If there is any discomfort, remove it in other ways than by excessive heat.

Wise mothers are coming also to have no carpets; to have, instead, rugs not too heavy for a woman to lift and to hang on a clothesline or rope, to be thoroly beaten free from dust and *aired*. For walls, floors and furnishings they are coming to use dust cloths that hold the dust instead of scattering it; to have windows and outside doors open while wiping it up so that as much as possible may blow out of the room. They are beginning to insist that architects shall not plan the fresh air box of the furnace to open on the dusty side of the house, perhaps the street

or a corner receiving its dust directly. Some ask "Why not two air boxes, so that we can close the dusty side on windy days?" They are keeping the hot air pipes from the furnace free from dust and the lining of the furnace in perfect repair so that gas and dust cannot escape into the rooms, and closing registers when ashes are being disturbed in the furnace below. They have fewer ornaments, heavy window draperies, portières and upholstered furnishings, all being dust promoters.

Ideal sleeping room

The most generous provision of good air can be in the sleeping room, where the school child spends nine hours every day. Here is the ideal during the coming nine months, below the latitude of Albany, and even above for hardy children; sleeping room—not dressing room.

Choose a small corner room with two windows, one toward the south, both over grass and trees, not over the street; literally nothing but the bed in the room, or two or three single beds for others; nothing on the floor and walls, no draperies at the windows, unless a plain holland shade "for looks" in the daytime; one sash in each window always open its full extent day and night, the fly screens in to keep out snow or rain; if a storm makes it necessary the blinds may be closed,

but not the window. There may be a very few days when on account of blowing dust or intense cold one of the two windows should be closed, but the southern sash should never be; in fact, both southern sashes could be taken out altogether, and usually are, the screen being made to fill the whole window.

Place the bed out of direct drafts, with head against an inner wall; furnish it with a hair mattress, cotton or outing flannel or woolen sheets, according to the weather, being sure that the mattress is warm enough or has an extra warm pad over it so that no possible chill can be felt from underneath; use woolen blankets, or for very cold weather a down puff which gives warmth without so much weight. The weight of many covers may cause the sleeper to awake feeling tired instead of rested. The covers during daytime should be kept folded over the foot of the bed, leaving it open to air and sunshine. In very cold weather one or two hot soapstones or hot flatirons (better than water bottles) wrapt in woolen (a bag is convenient) should be placed in the middle and bottom of the bed before bedtime. If in woolen they will keep warm all night.

The child should wear pajamas covering the feet, of outing flannel, or woolen in the coldest weather, with a cotton or flannel cap or hood coming over the forehead in the very coldest

weather, its cape extending down the back to the shoulders. Sleeping bags are usually not liked, altho travellers in northern lands cannot get along without them, and I will not describe them here.

This is ideal because it is genuine outdoor air for nine in twenty-four hours. An upper piazza would be quite as good or better, with screens to cut off winds, and ingenuity and good sense in using it.

Such sleeping will result in appetites for breakfast, *much less* susceptibility to "colds" thruout the winter, brighter color and steadier nerves next June, and the love of cleanliness that only habits of cleanliness can create. When mothers sympathize understandingly with this ideal (I know several who have realized it) they *will find ways to overcome difficulties* until something for their children results nearer it than exists at present for those fifteen millions about whom we are thinking.

Basement

One more place in a home that may make it unwholesome, no matter how well the foregoing points are attended to, is the cellar. The air of the basement penetrates the whole house, either between partitions not closed at the bottom, or thru cracks in floors and around doors,

or thru imperfect furnace flues or cold air chambers. It must be kept sweet and sanitary by whitewashings, ventilating thru open windows, and positively refusing to allow odors of any kind in it.

Mothers' clubs

With the determination to bring to pass an intelligent ideal great improvements are possible; but finally we come to the hard fact that many houses and streets make wholesome air impossible. This is the point where motherhood itself drives women out of their private homes into combinations of efforts for better enforcement of better laws for the sake of the children. The mother who has done wisely for her own must, even still for the sake of her own, help other mothers' children. In schools so full as ours the unhealthy child influences the healthy in many ways.

It is not possible here to say all that needs saying concerning the importance of outdoor air for children, and the harmfulness of the ordinary over-heated house air. So much—so *very* much depends on *convincing mothers of this*, that mothers' clubs in every city would be doing a public service this autumn if they would provide two or three open discussions on the subject. A speaker who has an up-to-date scientific training can make it very impressive and interesting.

November

The air children breathe at school

To keep the air in schoolhouses healthful is a more difficult problem. Like the air at home, it must be between 65° and 68°, comparatively free from dust and frequently renewed from out of doors.

How to clear away the material thrown into the air from so many bodies in rooms not proportionally as large as the rooms at home is one problem to solve. Another is how to keep floors, walls and furnishings free from dirt brought in on shoes and clothing, and created by the use of chalk and in some other ways.

Until intelligent women are on school committees concerned with school cleanliness the present conditions are likely to show little improvement. What they are is indicated not only by the statements last month, but by statistics in the Census showing that the average death rate from tuberculosis among teachers is considerably higher than the average death rate from tuberculosis in all occupations. The Census also gives figures showing that tuberculosis among children increases all thru school years. There is one kind of public school where this is not true. The statistics of open air schools show that it not only does not increase, but is actually prevented when feared, and cured in children where it is known to have begun. The

very first duty for mothers is to help bring the present health record of public schools up to the level of the record of open air schools. It is very largely a matter of good housekeeping which is their field.

Mothers in unofficial capacities can do some things to bring about better conditions. By visiting schools in one's own city and making written memoranda of special details (I shall tell later just how certain women have done it admirably), a collection of facts can be secured that will be useful, supplemented by our vital statistics, in pressing a public demand for improvement in common housekeeping in schools.

The Republicans or the Democrats, whichever party controls the schools, will of course object at first. They will say that things are all right as they are, and this can be disproved promptly by the vital statistics and local details gathered. Next they will urge that there is no money, and tabs will have to be kept on their spendings. It will almost always be easy to prove plenty of money, but that it is misspent on objects much less important than the health of potential fathers and mothers.

Dust and odors

Is the floor clean? Janitors and school men's standards of cleanliness are not those of the

careful housewife for her bare floors. I have heard of a club of women who obtained permission to keep one school building clean. It became an object lesson of another complexion and odor; but the women had to continue the work in order to continue the improvement.

Is the dust removed after the "dustless method" necessary at home? If not, it is imperative to bring it about promptly. This means vigorous and faithful effort until feather dusters are replaced by cloths used so as not to scatter the dust, with open windows allowing as much as possible to blow out, and certainly not within one hour before the assembling of pupils. I know a university man who led a movement to have little girls come to school early in the morning, poor things, to dust the school room in order to "teach them hygiene"! Another formed street cleaning clubs to pick up the dirty papers and put them in boxes!!

Are cloakrooms ventilated out of doors, not into schoolrooms? Is the basement clean and fresh smelling in all its divisions? If not, it must be kept so equally with the basement of the good housewife. Are the water-closets, both boys' and girls', as clean and fresh as those in healthful homes? Odors of disinfectants must not be accepted as proof of cleanliness. They merely disguise other odors, like perfumery. Cleanliness has no odor. I know an expensive normal school

that greets its visitors with the smell of a certain patented cleansing fluid used in wiping the floors, training teachers of the future in this standard for fresh air. Normal schools should not be neglected in the visiting.

Perhaps a school will be found with basement playrooms. I have never seen one that was not extremely dusty, especially the floor—which means the air. They are avowedly intended for rainy days; but are very frequently used for any days or merely misty and damp ones, with or without the knowledge of teachers. There are some schools that have no outdoor recesses. Parents should keep their children away from these schools, secure mothers' and all other clubs possible to appeal to school authorities, write to the papers, hold public meetings, and persist until outdoor recesses are established. Roofs are sometimes fitted up for playgrounds, neighboring vacant lots rented or loaned. As a last resort, abandon the school entirely, and build one somewhere else in the midst of a five acre lot, where school gardens, playgrounds, green grass and trees, can restore to children some of their rights; then furnish free transportation, by street cars or school omnibus, as private schools and rural communities are doing. We occupy but a very small fraction of our great territory. It is not necessity, it is neglect and indifference that is depriving children of mother nature's whole-

some, healing, inspiring face—crowding them off the surface of the earth rather too literally. See mortality statistics, Bureau of the Census.

Chalk and ventilating systems

Chalk dust can best be prevented by not using chalk. If that cannot be at once brought about, moist wipers must be used and not allowed when dry to scatter dust. Dry chalk erasers are as necessary to do away with as feather dusters.

Perhaps in the visiting a school will be found with a system of ventilation that does not allow windows to be opened. One should notice how the air compares with outside air; should learn how teachers and others like it after long hours in it; how the “system” is run. If its right working depends on the attention of some person, one may be assured from the experiences of very many people that the fallibility in all personal service extends to this ventilating system, and the children are helpless victims. The Key-word of this little book shows the way out. Almost all heating systems have not only air supply from out of doors, but also can connect with basement air when wanted. At night the open air in-take is shut off and basement air is sent to rooms instead, because less fuel is required to heat it. No one knows just how often on “cold” (how cold?) days, or when fire or fuel is low,

basement air is sent up to the rooms. It belongs to a sanitarian to decide, or to an intelligent caretaker of children. The practice of warming the rooms with basement air out of school hours helps explain why buildings unused so many hours out of the twenty-four and out of the week smell so stale. They need fresh air almost as much as children's lungs.

We have been drifting into artificiality, into "just-as-good" ideals, and only lately are coming to realize we cannot be a healthy people until we get back to clean air, clean water, clean foods, bodies and lives—the simple life. I am not sure that any "system" is preferable to direct open air in school. We are all sure that open country air is best for children. The conclusion is too obvious to state. Mothers' clubs must help study out ways and means—study out, not guess out.

And janitors

Has the janitor passed a civil service examination in school sanitation? Possibly he has taken an examination, but if it is found, on looking over the questions, that they relate to running the heating apparatus chiefly, or do not include questions testing substantial understanding of "cleaning house," there is a place to begin improvements. Neither superintendent nor jani-

tor can keep school air fresh with good intentions; they must know and use the proper methods for doing so.

Mothers' clubs may find it necessary to establish classes for training janitors in housewifery. Their salaries rival or exceed the salaries of teachers who are required to have extensive preparation for no more important service in kindergarten, primary and other grades. Clubs will better understand needs and ways of helping if they will compare their facts and ideas with school physician and school nurse in heart-to-heart talks; but even these officials must be kept up to the cherishing ideals of motherhood. Mothers cannot shirk their responsibilities on "paid workers" if the human race is to attain its best.

It probably occurs to some readers, I hope it does, that in this matter of housecleaning in public schools much better than a man might be a woman as superintendent of such work; not any good woman, but one who is either a graduate in nursing or in home economics, with a scientific conscience and technical training in sanitation.

December

Dirty children and fresh air

Unclean bodies and clothing contribute as much to school fatigue as an unclean house, both

at home and at school. They produce physical ailments and mental lassitude in two ways: by befouling the air that all in the room must breathe, and by depressing the child's own vitality through lack of a needed nerve tonic—the right sort of bath.

If some chemical were poured over the human body that would destroy all of it except the nervous system, we would have remaining an almost perfect model of it, a lacelike structure, apparently made of innumerable white threads running into larger and larger cords and finally to the brain. So closely alongside each other do the finest white threads start from the skin on their way to the brain that in many places a pin point can hardly be past between them. These nerves are like telegraph wires carrying news to the brain and messages back.

The best part of bathing is its effect on nerves and brain. More people need to appreciate that the right kind of bath is an ideal tonic. The warm bath with soap removes dirt and perspiration (waste poured out of the body on the skin), and the rubbing over these thousands of nerve endings in the skin sends messages along them, resulting in dilating blood vessels in the skin, making it warmer and withdrawing this blood from other parts. It draws some of it from the brain leaving the brain in a better condition for sleep than work. Brain like muscle must have

an extra supply of blood when it works. Therefore this is the kind of bath to take before sleep.

But when energy is wanted, whether of brain or body, cold on these nerve endings is the stimulus to apply, cold that is cold enough to make a little gasp for breath as it flashes over face, chest and neck, and down the back. This is the "tonic" to be taken in the morning before the day's work.

The "cold tonic" is not for cleanliness, but for vigor. It clears the brain and body of the last remnants of sleep, helps cure cold feet and improves the circulation in other ways, steadies nerves, and is, like open windows at night, a fine appetizer. It should be taken in a warm room (70° to 75°). If "the bathroom cannot be made warm so early in the morning" by furnace heat, use a gas radiator for ten minutes. It makes the air bad; but the value of the tonic exceeds the harm done in *only* ten minutes.

The tonic bath need not exceed one minute. A warm bath in the morning should always be followed by the cold dash on face, chest and especially on the back. When accustomed to it one's body cries out for it as it calls for water when thirsty. The tonic may be taken without the warm bath, of course. When the child is not accustomed to it, begin by a dash of cold water over face and chest while standing in the tub. Dry at once, rubbing warm; next day try a

quart, dasht over face and chest and down the back along the spine. This should be as cold as the faucet will give. If the child does not like it persevere in this without increasing for a while. As soon as a dash of cold water all over can be taken, the "morning tonic"—the best one in the world—is assured.

If there is not time for this morning dash and rub before school the remedy is to retire earlier at night and get up earlier in the morning. *It is not to omit the tonic.* The child's vigor is worth it.

Children's clothing absorbs odors from their bodies and from rooms, especially odors of cooking and tobacco. Entirely different clothing should be used for sleeping, especially the under-vest; and all the day clothing should be spread out on a line or on chairs in the open air sleeping room for ventilation. In the morning it should be entirely free from odors, and can be warmed while the bath is going on. A very considerable part of the offensive odors in all schools comes from unclean clothing.

Mothers having taken these measures for conserving strength and happiness in their dearest must next seek methods for helping those less cared for, whose neglect is befouling school-room air. Clubs can help greatly by learning how school baths and other city baths are provided in some places, and popularizing the idea at home.

The very best thing for a school is to have a swimming tank, its own or a suitable one elsewhere. Sometimes a swimming tank has been presented as a memorial to a pupil or instructor. A mothers' club might do this in the name of one whom it wisht to honor. Here cleanliness, a tonic, and the art by which one's own life and the lives of others may be preserved from death by drowning are secured all in one, together with an ideal physical exercise ("gymnastics") for developing heart and lungs. The better heart and lungs in a child, the less school fatigue and the longer life is assured. Many English schools have swimming, as ours ought to have.

In looking further into this subject mothers will find very useful information in *Public Baths in the United States*, by G. W. W. Hanger, Bulletin of the Bureau of Labor, No. 54, September, 1904. It is a part of the exhibit of the Bureau at the Louisiana Purchase Exposition. Possibly it is one of the Government publications that is for free distribution. Address the Government Printing Office at Washington. There is also an interesting English book, *Modern Baths and Bath Houses*, by W. Paul Gerhard, C. E., published in 1908. Brookline, Massachusetts, has one of the best public baths for children and others. It is described in *American Public Health Association Journal*, 1897. There are also many other recent reports on baths for schools

which can be found by consulting the librarian at the public library. It would be a great mistake to do anything without reading up on the matter, for there are many "new ideas," as, for example, that bathtubs should not be provided, *because they are not kept clean*. Instead, spray, or "rain," or "needle" baths are best where the spray comes from the side, not from above—wetting the hair. The best of all, however, is a swimming pool.

The justification for clubs in these strenuous days is performance as well as papers. Where one has helped provide a swimming tank for boys and girls all the seasons thru, there will be more of health, morals, life and joy in that community thereafter.

January

Internal cleanliness: carious teeth

Probably more than ninety out of every hundred children have decaying teeth. This means offensive breath, increasing the bad air of school rooms.

It means much more to the children having them, and is one of the most serious as well as common causes of school fatigue and various

forms of ill health. The decaying spots are nests of decomposing food and disease producing bacteria. These and bacterial toxins (poisons) swallowed undermine the general health, and cause other troubles about the throat and nose. The poisons spread from teeth to neighboring glands and openings, causing earache, enlarged glands, catarrh, as well as tender gums and "toothache." The poisonous condition of the mouth aggravates the results of scarlet fever or any other illness, and increases the danger of ear complications.

Swallowing these virulent poisons impairs digestion, and anemia is almost always found with carious teeth. Nutrition being poor from indigestion, even if good food is given, tuberculosis and other diseases find an easier victim. The pain of chewing food when the mouth is uncomfortable causes children to swallow without chewing as they ought, thus increasing indigestion and forming a bad habit for life.

In these ways physical growth is impaired, the nervous system becomes more irritable, mental development is hindered. Just as good care should be taken of the first teeth as of the permanent ones, not only for the sake of the general health, but because their condition affects the development of the jaw and of the permanent teeth coming in the same places.

Causes of carious teeth

When the health of the mother is poor before the child is born, or if syphilis is inherited, or if the health of the child is poor, poor teeth usually result. Poor teeth are also the result of neglect to clean away food particles before they begin to decompose. Certain substances, especially acids, injure the teeth; also ice water and very hot fluids. These same very hot and very cold temperatures injure the stomach as well.

Lack of exercise is bad for the teeth, the exercise of chewing hard food. The hard particles polish the teeth, and the firm pressure in chewing develops the jaws, increasing circulation to the roots of the teeth, by which their nutrition is improved. When teeth do not meet properly indigestion sometimes results from insufficient mastication and the teeth will decay more easily. It is probably because the jaws are not developed as they should be, and such children should be taken to a good dentist who can alter the condition when the child is young, greatly to the advantage of both health and looks.

Prevention

Children must form the habit of using their toothbrushes and quill toothpicks in the privacy of their own rooms; the splinters that break from wooden toothpicks make them less desirable.

If mothers themselves are really in earnest and convinced of the importance of saving the teeth, they can make their children so. Otherwise nothing in a magazine or book can do it. The children must suffer the consequences. Mothers' clubs have a responsibility for creating this intelligence thruout their communities.

In these days of breakfast foods and other prepared foods too little real chewing is done. Pains should be taken to provide some hard and tough food, and to insist on its being chewed until in a fluid state when it "swallows itself." This is not easy when the habit of "bolting" food and drink is establisht; but it is worth much effort, for a good digestion is one of the best preventives of intemperance and other manifestations of ill health. Perseverance pays in this. I know a mother who never gives her children anything to eat between meals unless they are hungry enough to eat a crust—for the teeth's sake.

School dentists should be in every school quite as much as medical inspectors. The dentist will have even more work to do, since hardly three in a hundred mouths do not need attention. For several years they have been appointed in Germany; also in England and other European countries more recently. We are later in taking it up; but have begun to appoint them, and each year their number is greater.

Many schools where there is none stand waiting for the impulse from mothers' clubs which could render few great services so easily. An open meeting with a talk by an efficient dentist, and physician or school inspector, followed up later by a little tactful pushing can hardly fail to get dental school inspection established, with provision for children too poor to have the necessary work done, just as children's eyes are cared for when parents cannot to it. Teachers must be informed and interested, as their cooperation is of the greatest value. No child can do its best with a septic mouth, and it is wholly worth while for society to save itself from poor citizens by preventing their development.

If toothbrushes are not a success at home, in some schools a rack and brush bearing the same number are given the child, and he is required to use the brush in the morning and at noon. But this is a pity; cannot the visiting nurse bring it about at home? It is most important to clean the teeth thoroly at bedtime. One simple help in keeping the mouth as it should be is the habit of drinking a little water at the end of the meal. The last word given out by nose and throat specialists of which I have heard is that probably very many more of our illnesses come from bad mouths and teeth than we have thus far known.

February

Internal cleanliness: elimination of waste

The waste in the large intestine, after the nourishing parts of food have been absorbed into the body thru the walls of stomach and small intestine, is sometimes compared to the ashes, vapor and gases given off by a steam engine using coal and water for "food" to supply its working power. In the body other waste also results from using up parts of itself in muscular and mental work; a portion of the food eaten goes to restoring these parts.

Unless the waste is cleared away it "clogs the system," doing harm by pressure of the mass of waste on surrounding parts, or by acting as a slow poison. In these and other ways constipation becomes one of the common causes of school fatigue. The waste is eliminated chiefly thru the intestine, kidneys, lungs and skin. For the lungs and skin cool fresh air, water and exercise have been mentioned as essential to health. They are also essential in keeping kidneys and intestine in order. These are like all parts of the body under control of the nervous system; so that whatever helps maintain a healthy nervous system helps very much both kidneys and intestine in doing their work.

Water, food and habit

Pure water at the natural temperature, not iced, can hardly be drunk too freely if thirsted for, specially by a child who perspires considerably. It should, however, be taken between meals, not in large quantities with them, and should never be "bolted."

Properly taken it "flushes out" the system, chiefly thru the kidneys; but also thru the intestine, as well as lungs and skin. One common cause of constipation is too dry feces, requiring straining at stool. A glass of water (in winter it may be hot if preferred) taken, a few swallows at a time, while dressing in the morning or while undressing at night, sometimes prevents constipation. Three or four glasses more are needed during the day. A tablespoonful of wet flaxseed, taken at night, is an old fashioned and perfectly harmless way of "oiling" the intestinal tract, so that dry hard stools may slip along more easily.

Fruits and nuts, the choice of which depends partly on the child, should be used freely. Prunes and figs, either cookt or eaten as confectionery, are well known helps. Apples are often good. Bananas, if ripe, are good; if not ripe they can be baked in the skin or peeled and baked with a sauce of sugar, lemon juice and butter. Many who cannot, or think they cannot use bananas, find the cookt banana excellent. It often agrees with very "difficult" stomachs. Fruits and

vegetables help because of their salts and acids especially. A diet should be varied from day to day in preventing constipation that is obstinate. The use of molasses is also recommended.

General suggestions such as these have a general value; but it must be remembered that each child has his own peculiarities that should be consulted in establishing the habit that is imperative—a daily evacuation of the bowels. *One most important aid is a regular hour daily.* Habit is one of the most interesting and perhaps unappreciated factors in living—habits of body, habits of acting, habits of thinking. The child trained to empty the bowel after breakfast has regularly at that hour the intestinal sensation impelling him to do so. If, however, he restrains this, the next day it is much less or gone. Usually after breakfast or at bedtime are the most convenient hours and, therefore, the most regularly observed. In requiring this habit of regularity, as well as other right habits, mothers have nature's cooperation.

Results of constipation

It is a mistake to have the medicine habit for constipation. It is very unusual that suitable diet, water and exercise fail to secure the one daily evacuation necessary. No mother is forgivable for failing to establish this habit in her

children, together with an appreciation of the "internal cleanliness" in which it is a factor. The child's habit of constipation cannot always be easily corrected in later life. It causes sometimes local trouble, such as hemorrhoids, or fissures (cracks) in the anus that increase constipation because so painful, and other results even more serious. It is a cause of anemia, headache, mental dullness, irritability, loss of appetite, with the coated tongue that makes an offensive breath and unclean mouth whose harmfulness we have learned. It is almost always found in girls who have painful menstruation, or undeveloped or misplaced pelvic organs. The results, therefore, are liable to be so serious that when mothers cannot prevent constipation by their own efforts they should consult a physician rather than allow the habit to go on, particularly between nine and sixteen years of age. We might more wisely say from infancy to sixteen; but the tendency to it is increased during school life by sitting positions and habits, so that special attention is called to it during these years.

One of the sitting positions inviting constipation and other ills is the very common habit of sitting on the lower part of the back instead of on buttocks and upper part of thighs. With the former wrong position, and sometimes even with the latter, children and others are often seen with chest dropt forward, so that between the crowding

down from above and crowding up from below the abdominal and thoracic circulation is greatly impeded, digestive and other organs being squeezed out of place and shape. Corsets compressing laterally do no more harm, I fancy, than this vertical compression in the corsetless. It is restful, literally so, to sit and stand erect, and children trained to it become less easily fatigued. This does not mean that the backs of seats should not be used, but means that the spine should not be curved forward in using them. School seats with properly shaped backs are necessary.

This is one of the reasons why mothers' clubs should urge changes in school curricula by which children can have more moving about during school hours; manual training rooms with workbenches, domestic science rooms with worktables, nature study (or botany, zoology, or biology) rooms with specimens to examine grown in the children's own school gardens or collected on country walks; "organized games," dancing and other physical exercise, not forgetting one of the most important, swimming.

It is not necessary that school customs invite ill health. Books are not the only road to wisdom, possibly not even the best, as we have been assuming.

*March**What and when school children should eat*

Important as are external and internal cleanliness in preventing school fatigue, nutrition is no less so. Each detail is so dependent on the others that when one is neglected all suffer.

Many children are started wrong in the morning. Perhaps because they slept in a room with closed windows, or because of bad teeth or constipation that "spoil" the mouth, or because they lack that "morning tonic"—for these or other reasons they have little appetite for breakfast. We have discust these points.

Too often breakfast is a hurried snatch instead of being appetizingly served like the later meals. Many children go to school improperly bathed and fed because of late rising, probably due to late hours the night before. In some foreign cities and in some of our own schools open at eight o'clock or eight-thirty. Earlier hours both morning and night are better for children and for grown-ups. We live too much by artificial light, and miss the exhilarating morning freshness. The question is when will more parents adopt more wholesome hours for the children's good, and more wholesome food when they set but one table, and furnish more wholesome examples in some other particulars.

There is, too, the fact that for some a hearty meal as the first event of the day is not indicated.

For these and other reasons very many go to school (as to other duties) without enough to sustain them until half past twelve or one o'clock. This is the cause of much "school fatigue," as well as of breaking down among office workers and others.

Some public and many private schools serve a glass of milk or cocoa and a biscuit between half past ten and eleven o'clock. It is a pretty and a wise custom I have seen, to have the children before the lunch is brought in sit for two or three minutes with heads lying on the desks, resting peacefully. Certain children bring in the food on trays, giving to each a paper napkin for the desk and another for the hands. The children learn to serve and to eat daintily, the whole event not requiring more than six or seven minutes. Those who can afford to do so pay a few cents a week; but all have the food, no one knowing who does not pay. There are several ways of doing this. Wherever attempted, the resulting better work and vitality thru the year justify the plan.

The noon luncheon is another item in preventing school fatigue. Children often bring unsuitable food from home and spend their pennies on poor stuff. It is said that a noon dinner for those who go home interferes with good work in the afternoon session. The mother sometimes is away at work and there is no suitable dinner at

home. The custom of lunching at school is growing. Caterers who frequently serve the luncheon are not dietitians, and I have never seen any school lunches served by them that were as wholesome or as well served as certain ones served by mothers' clubs. They perhaps employ a business woman or man; but are themselves represented by two or three ladies present every day. The variety on a single day is much less than that of caterers; the fancy and "made dishes" fewer; but the variety from day to day is ample, and children are thoroly satisfied with the excellence and daintiness of the simpler menu.

In some English schools and in a few of ours the domestic science classes prepare and serve the luncheons, or a portion of them. This may be done so as to be fine training for the pupils, and results encourage further experimenting. In other ways this problem of morning and noon lunches of better quality than that brought from home is being studied. Whoever undertakes it should have a definite understanding of elementary principles of nutrition. This is not too difficult for mothers' clubs to set about acquiring. A competent instructor (very many are not so) can in a few lessons to a group make the subject clear enough for this purpose, or some may decide to give one whole year to the study of school lunches, while another group gives its attention to schoolhouse cleaning. In almost

every organization there are members who wish to concentrate on some special studies and lines of effort. By encouraging and assisting them to do so valuable members are likely to be had and progressive usefulness secured. The club as a whole may continue its general programs which will be strengthened by occasional contributions from the special workers. All can concentrate on a common purpose when it has been developed.

The United States Bureau of Education has recently issued Bulletin, 1909, No. 3, *The Daily Meals of School Children* by Caroline L. Hunt. It can be obtained on request by addressing the Bureau at Washington as above. The secretary of every club should include this in its circulating or reference library. Another help in providing the right foods for children, which can be had on application, is the *Bulletins on Human Nutrition* issued by the State College of Agriculture at Cornell University, Ithaca, New York. Address Dr. L. H. Bailey, Director. Also the department of home economics in every state agricultural college is always glad to assist mothers' clubs in their study of how to feed children, and it is a very good thing to keep in touch with this department.

There is an article on "The School Luncheon" by Lucy A. Osborne, of the Worcester Trade School for Girls, in *The Pedagogical Seminary*, June, 1912, that will perhaps be most helpful,

since it surveys the field quite thoroly, and also has a large number of references to the writings of others. This magazine should be in every public library for the use of mothers' clubs, for it contains the valuable studies concerning children made year by year at Clark University, or made outside by its graduates.

No attempt is worth while here to enter into details of dietetics, for they need pages, time and discussion. In Miss Hunt's Bulletin, besides helpful and practical directions, a few good references will be found to other writings. There is almost no improvement in the curriculum of public schools that women can more becomingly urge than the teaching of domestic science, with the insistence on appointing a really competent instructor. Simple cookery and sewing in the upper grammar grades is needed; but in the high schools a very much larger outlook should be given, to include the family responsibilities and duties of home makers. Our high schools must turn out intelligent home makers before the prevention of school fatigue can be realized. Even then we shall have on hand the question what to do for the millions of young men and women between sixteen and twenty-five years of age, who dropt out of primary and grammar grades, are liable to become parents, and have only this childhood's education and information pickt up from newspapers, streets, companions

and the like with which to bring up their children.

Boys as well as girls become home makers, and their intelligence must be equally assured. I have found in various places boys in the grammar or lower grades learning to sew on buttons and do simple mending and darning, learning simple cookery for "when mother is sick," or for camping. This is what all soldiers and sailors and ranchmen do, what George Junior Republic boys, Boy Scouts and many others do. Mothers should help public schools to supply instruction in this important need of boys, and should train their own to take care of themselves and their rooms and belongings after decent and sanitary fashion. In England I found boys and girls in classes studying about choosing the site, building the house, plumbing, ventilation and other details of home sanitation; pure food laws, detecting adulterations; disposal of waste, orderly premises, clean streets, all of which concern boys as much as girls. It raises the idea of home to have it of enough dignity and worth to study in school.

The problem of school fatigue is most hopefully undertaken thru this national instruction in home making, being mindful that all the concerns of the community and all the concerns of the home in this age are identical.

April

Muscular exercise an internal bath

Physical exercise is a large factor in preventing school fatigue.

I am writing by the open library window of a university overlooking the valley of the Monongahela and purple hills beyond, where the first spring thunder shower is circling. On the campus to the left is an imposing gymnasium with baths and all the other up-to-date features, such as physical examinations, a generous athletic field, and an expert to guide their use wisely.

The students, only one out of a hundred in the public schools, young men and women, are having this care of their health for the first time, after ten or twelve years of "laying foundations" without it. It is well within the truth to say that they would average three years better in capacity for citizenship if the elementary schools had attended to their personal habits, play and formal exercise and physical defects. It is certainly beginning at the wrong end. But it is in line with the history of our schools which have been developed with the idea that college and university is their objective. What of the ninety-nine in each hundred who do not go to college? We are only recently seeing—with a still limited vision—that public schools would better train in right living than for college.

A few days ago I was in a rather famous

elementary school, famous because part of a great institution that turns out teachers. I saw several classes in gymnastics, and this was the way of it: They exercised in a square entrance hall into which dust was trackt from the streets of this "soft coal city" by thousands of feet daily. The windows up the stairway were closed (they had a system of heating and ventilating forbidding opening windows); the thermometer registered 70°-74°. After a class had rollickt with open mouths thru some very lively gyrations my own face and throat were parcht with dust and heat and foul air; the pupils' faces were red, bodies perspiring and odorous, and there was coughing on all sides to clear the throats. Laughter and breathlessness and the beautiful elasticity after abuse of which childhood has so much (or what would we come to!) covered the sins of omission and commission in the teachers' eyes, and one said to me, "Can anyone say that *this* ought not to be in the public schools!" With much restraint I replied, "Yes. It ought *not*. It ought to be out in that concreted yard this glorious day." He saw the point partly perhaps, but the inflexible monster, "system," mechanical, shortsighted, is doubtless grinding along to-day in that entrance hall, as it has thru the years, sending out teachers by the thousand with standards accordingly.

If mothers thru their clubs would throw their energy into the growing demand for as wholesome

or more wholesome environment for the little children of the nation as for the big ones, we would "arrive" much sooner.

To fit a few of the children for college schools have exercised all children by chiefly the "tiny eye and tongue and pen wagging muscles," with body in a stooping position that compresses heart, lungs, digestive and pelvic organs. This period of most rapid growth should make sure of the full development of these vital organs, and of the nervous system, which determine length and usefulness of life; and of the reproductive organs also, whose development depends largely on a free circulation. Vigorous circulation requires a strong heart; which comes by exercise of the heart muscle, as other muscles are strengthened by exercise. Heart and lungs are physiologically one; the development of one means both. It is exercise of large muscles, those of the back, legs, arms, that most increases pulse and respiration (heart and lung action), fitting them for the sudden and long continued strains of life. Parents need to remember that good hearts, lungs, digestive, reproductive and nervous systems are the most important aims of exercise; and that reasonably energetic use of the large muscles in cool fresh air is the way to accomplish it. By this we acquire the vigor underlying mental and physical work, lack of which is quite as often the cause of incapacity and failure as is lack of knowledge.

Exercise drives the blood and lymph more strongly thru every "nook and cranny," using up "fuel" stored so long it needs to be used to make way for fresher, sweeping away waste more thoroly, and bringing to all parts abundance of food and oxygen. This is another kind of "bath," another method of securing "internal cleanliness." These "toxins" and wastes that are removed are not only a cause of feeling tired (poisoned), but are often a cause of "the blues," of feeling discouraged, "cross," incapable.

To prevent school fatigue, or to drive it away by exercise, another thing is necessary—the play spirit. Just as gymnastics in hot foul air are bad, so gymnastics not enjoyed, "a bore," fail to accomplish all they might. Therefore, playgrounds, and rhythmic, artistic or historic games and dances are supplementing gymnasias and replacing formal drill. Remembering the poor gymnastics usually seen in ordinary schools, parents will probably "err on the right side" if they urge instead playgrounds and *capable supervision*. A combination of both excellent gymnastics and delightful play, including dancing, is best; and I have seen it—but only very rarely. Gymnastics, when weather permits, should be in the playgrounds; mothers who understand the need of open air can help persuade officials of this. Competition in running, jumping, dancing or other exercise that leaves the child exhausted at the

day's end, or the next day, is not a help in preventing school fatigue, and is as unwise as not enough exercise.

Parents should visit schools during exercise time; and if the atmosphere has not the open air freshness, accept no excuse that is not weightier than health itself. Many "best we can do's" are not true. It is rather official lack of intelligence or conscience ("high up" possibly), resourcefulness, willingness, in adapting conditions to the laws of health. If the children are not heartily enjoying the work or the fun, try to find out what is wrong (not always easy), and have it set right promptly and wisely. It is too vital to ignore.

Gymnastics and supervised recreation at school are but one means of preventing school fatigue. Development of heart, lungs, nervous system and body framework, the sweeping away of fatigue poisons and the renewal of tissues can be secured perhaps even better by excursions to fields, forests and hills; by boating, swimming and skating; by running errands, gardening and other out of door usefulnesses—if parents have the tact to introduce the play spirit, interest in some purpose, and enjoyment.

May

Idleness, evenings, dress and cigarettes

There is more than physical benefit to think of in aiming to prevent school fatigue by filling out-of-school hours with occupations calling for bodily, mental and moral activities differing from but supplementing school life. Kipling states it picturesquely.

The Camel's hump is an ugly hump
Which well you may see at the Zoo;
But uglier still is the hump we get
From having too little to do.

Kiddies and grown-ups too-oo-oo,
If we haven't enough to do-oo-oo,
We get the hump—
Cameelious hump—
The hump that is black and blue.

We climb out of bed with a frowzly head
And a snarly-yarly voice.
We shiver and scowl and we grunt and we growl
At our bath and our boots and our toys.

And there ought to be a corner for me
(And I know there is one for you)
When we get the hump—
Cameelious hump—
The hump that is black and blue.

The cure for this ill is not to sit still,
Or frowst with a book by the fire;
But to take a large hoe and a shovel also,
And dig till you gently perspire.

And then you will find that the sun and the wind,
And the Djinn of the garden too,
Have lifted the hump—
The horrible hump—
The hump that is black and blue.

I get it as well as you-oo-oo—
If I haven't enough to do-oo-oo—
 We all get the hump—
 Cameelious hump—
Kiddies and grown-ups too.

Particularly at the ages from ten to sixteen, when child is rapidly developing into adult, too little to do is a genuine evil. Mothers should guard against idle hours, day-dreaming and poring over story books. The last is liable to become a dissipation, and all are liable to encourage wastefulness of thought force and moral force, even inviting vicious habits of mind and body. "School fatigue," i.e., indifference to work, pallor and nervousness, can result from these misspent hours quite as surely as from bad air and sitting habits in school.

School children's evenings should be spent at home, and the retiring hour should be early. To school children evening parties, theatres, concerts and other entertainments *are never worth their cost in hours of sleep*. These hours of sleep and the "simple life" are more important than parents usually think; the "educational value" of evening entertainments much less.

The cigarette habit, quite apt to be begun by elementary schoolboys, is harmful from every viewpoint. So long as many men and a few women consider it suitable for themselves, and so long as others peacefully submit to having the

air of city streets, homes, hotels, restaurants, places of amusement and "recreation" polluted by tobacco smoke, so long the boy and occasionally the girl will "ape their elders." Example and imitation is the most powerful "educational system." The tobacco smoke evil should be made to go with the soft coal smoke evil.

A teacher once told me of having noticed in her forty years of service "waves" of the cigarette habit come and go with the transit of popular masters who smoked. Another, during a serious talk with her boys was interrupted by the principal passing thru the room, leaving behind the characteristic odor. Thereupon one boy argued, "The boss smokes." Professor William A. McKeever has a valuable article, *The Cigarette Smoking Boy*, in *Child-Welfare Magazine* for April, 1910; and another in *Education*, November, 1907. *Education* also publishes *The Boy and the Cigarette Habit* by H. S. Gray, January, 1909. The Health-Education League of Boston has a five cent leaflet, *The Boy and The Cigarette*; address 8 Beacon Street, Boston. All authorities agree that, whether or not smoking injures adults, it certainly seriously injures children both physically and mentally—this means morally also.

Dress

Dress is a factor in school fatigue that concerns girls more than boys. So much has been said

during so many years against compressing the bodies of girls that the majority are drest with considerable freedom and good judgment in this respect. Nothing that could be presented in these pages would alter the habits of others. There are two points that need mention, the dress of the head and of the feet.

For the head I will only briefly plead for simpler hair dressing. The heat and confinement of the scalp when the hair is loaded with ribbons, combs, and frames for distorting the shape of the head are not only injurious to the growth of hair, but wearying. We all know the refreshment of letting loose long hair and giving the scalp air and friction. A friend says, "I am so tired I must rest my hair." This is one of the little things that help make up the day's weariness, like the strain of defective vision and hearing which we shall discuss further on in the volume. Those who wish our American girls to be beautiful, and compare the heads of Greek women that are as lovely today as two thousand years ago with photographs of modern coiffures, plead for simpler hairdressing among girls purely on artistic grounds.

The dressing of the feet is still more important. The reason why girls should wear low heels (not more than one inch) and thick soles except in the two or three months of hot weather is that high heels and thin soles in cool weather are

at the root of much of the ill health of menstruation and of later life. The high heels compel certain muscles to pull back in order to maintain the balance. This alters the normal angles at the pelvis to the future injury of the woman, and requires constant tho perhaps unconscious effort of muscles holding the body erect that wearies like all constant effort. High heels produce a most ungraceful walk and weaken the arch of the foot which was designed for a level foot. This lessens the enjoyment of walking, climbing and other open air pleasures that girls need.

Thin soles that allow the chill of the ground to pass to the foot and so to affect the body are a factor in painful menstruation. This cooling of the soles may not be noticed by the wearer, but delicate nerves are carrying their sensations and impulses thru lower extremities and pelvis to and from the spinal and central nervous system continually. There are not more than three months when the thickness of the middle forepart of the sole can wisely be less than one-quarter of an inch for either boys or girls. Thick soles can be soft and flexible. There should be some law regulating the degree of monstrosity merchants may offer customers, and requiring hygienic footgear as definitely as law requires unadulterated food.

Another point about shoes that causes fatigue is the thousands of impacts daily of the hard

heel on the hard pavement, jarring the delicate tissues of the cerebro-spinal nervous system. Nature gave us elastic heels for an elastic earth. I have found rubber ones (there is a good quality that outlasts the shoe) excellent in preventing fatigue and restoring exhausted nerves of patients. City children, certainly if not strong, would be better with them.

June

The long vacation

In conclusion, not the least important item in preventing school fatigue is to start the school year in good condition. This means living the long vacation sensibly—if we must have long vacations. “Sensibly” translated into details should stand for early rising and early retiring, the tonic bath and all habits of external cleanliness, care of the mouth and all habits of internal cleanliness continued, with every minute possible spent in the open air; *no wasted hours*. Certain regular duties and responsibilities add to the enjoyment when wisely assigned. Summer is the time for developing home ideals and interest in home affairs, for families to become acquainted who have been separated by winter’s occupations,

and for mothers and fathers to grow into friendships with their children whom teachers have monopolized during their best hours.

Summer is the time for gardening, swimming and boating, hill climbing, forests, fields and sports. Mothers should make summer at home a "vacation school" for their own children—not leave it to "run to waste." Teachers have told me that many return to school in the autumn having lost ground in many ways; that "vacation school" children are in better form mentally and physically, and by "vacation school" we mean all the entertainments that have been mentioned provided for the children by teachers who are nature lovers, play experts, instructors in hand work and domestic work—all the good things they do not get in school, and some of them cannot get at home. Many mothers' clubs plan to make the long vacation more profitable and happier for children with poor homes by supplying these play schools, summer gardens and nature study excursions.

II

MOTHERS' CLUBS AND CLEAN SCHOOLHOUSES

The standard of healthfulness in schoolhouses should be that in the best kept homes

November

Men as housekeepers

In our discussion of school fatigue we mentioned last November the injurious effects of dusty, dry, overheated air in schoolrooms. Those few paragraphs are much too little for mothers—conscientious mothers—on this extremely important matter of healthful schools.

Many clubs are taking up the subject; also the Department of Science Instruction of the National Education Association has appointed a committee on the sanitary care of school premises, with an advisory committee of experts in sanitation. If mothers persevere in agitating for clean schoolhouses, and if this committee makes a practical report in accordance with scientific facts, undoubtedly improvements will result.

Already there are numerous signs of public awakening to the importance of janitors among school officials.

The government or the public opinion that compels children to attend school is under moral obligation to keep the school as clean and wholesome as at least the best kept homes from which they are taken. If it be possible to improve on the best homes, it is for the interests of society to do so. Otherwise schools become a place where nose and throat and lung diseases are invited, contagions acquired; where the nervous system and the functions of the body, all of which are controlled by the nervous system, are injured. When seedlings are badly placed and starved they do not mature, or they are always inferior to those given plenty of sunlight, water and open air. So these children in dirty schoolhouses help increase the number of ailing grown-ups, and their children are born less vigorous than they might have been with sturdy parents.

There are few things more illogical—it would be a huge joke if it were not so terribly tragic—than for a government of fathers to collect all sorts and conditions of children away from their mothers, in public buildings cared for by ordinary working men (rarely by women) without training in housekeeping or health methods.

No good housewives have the dirty, dusty floors and bad smells with which government

shuts up children and teachers. Women, even tho "naturally" housekeepers, are more and more often being trained for "their mission;" nurses in their schools, other women in schools and classes for home economics or domestic science, or perhaps in technical, industrial or trade schools. Even in colleges and universities training for home making is coming into its own and is being granted degrees of bachelor of science and doctor of philosophy as is done in courses designed more especially for men. This is because good housekeeping is really the practical application of certain scientific principles in the arts of healthful living, and it is nothing less.

But those who have "kept house" for several hundred millions of children at school in the United States have been and are, for the most part, untrained and little educated men appointed by other men likewise ignorant of sanitation and housewifery—rather inclined, in fact, to look down on housework as beneath a man—and therefore not capable judges of janitors' efficiency. The plea that all concerned meant well or mean well lessens in no smallest degree the evil effects of unsanitary conditions on children and teachers.

Bad school housekeeping is partly, also, because schools "are in politics," and our partizan politics based on "majority rule" long ago adopted the slogan, "To the victor belong the spoils." This means that one way of rewarding

a man for his vote is for the successful candidate or party to secure him an appointment to a position—one with a salary usually preferred. School janitors, for example, are often appointed for their party loyalty rather than for qualifications in sanitary care of the environment of children—our “neglected national asset.” More than one has argued like the janitor of whom a university professor and ex-principal recently told me, “You can’t put me out. Others have tried it and failed. Senator —— got me this place.” (Incidentally—to encourage other principals in well doing—he was put out this time.)

There are other calls on the mothers of the nation as great, *but none greater than this to keep schoolhouses as wholesome as the best homes.* It has much to do with morals and success in life. Clear heads to judge what is right or wrong and what makes for prosperity or for failure depend largely on healthy bodies.

The death rate from tuberculosis among teachers is considerably higher than among all other workers together. Tuberculosis has been found after death among more than half the children examined who died from diphtheria, scarlet fever and other diseases, the presence of tuberculosis not being suspected. The X-ray and tuberculin test have discovered latent tuberculosis in nearly half the delicate children examined. These are more likely to succumb to

other diseases, having this latent, and it is likely to start up actively as the result of other diseases or of any cause which lessens the general health and resisting power, as school conditions often do. All who have studied the subject agree that schools are often the cause of nervous disorders, pallor and a group of symptoms that we have labelled "school fatigue," altho they may be in part due to inefficient mothers and fathers at home—most of whom are products of the public schools that have not prepared their pupils to be wise fathers and mothers.

This is a "vicious circle" for mothers to break. Let us admit that schools as now managed are not as wholesome as they should and can be. Since dusty, vitiated, arid and overheated air are known to be common factors in tuberculosis and nervous troubles, mothers' help is needed in bringing about the day of clean, well aired schools, a condition as much like open air as possible.

The fault does not lie with the janitors. If working men or women without specially qualifying can get positions that bring in from \$700 to \$3,000 a year, which our cities usually pay janitors, naturally they take them. The voters and the mothers have not yet insisted on efficient caretakers and clean schoolhouses. All of us like to receive as much for our service as we can get, "other things being equal."

Neither is the fault with the teachers. Institutions training general teachers rarely give them practice in school sanitation, and rarely even set them good examples; also the governing boards usually permit them merely to report faulty conditions; they must not be more active in improving them. Housekeepers know that it requires constant "following up" of unskilled workers to secure the details of cleanliness and temperature on which health depends. As I have said in another place, the teacher must "nag" the principal and "tell on" the janitor, jeopardizing her position that she has no political power to defend. Teachers and children are usually helpless "between the devil and the deep sea" in this matter.

We are justified in expecting good housekeeping for schools in at least the nine or ten states where women are now citizens with the duties and responsibilities of citizens (this sentence has been revised to 1913). If mothers and housekeepers, whose "points of view governments have suffered so long without," bring into public service for children the trained skill of home makers, than which we have no greater need just now, the value of ballots in their hands is proved. If they continue school standards inferior to those of the best kept homes, the standards of men who are not housekeepers, they throw away a golden opportunity to help unfranchised women, in

addition to overlooking the welfare of children. This social service is the most convincing argument. Thoroly healthful schools are entirely possible. I have seen a few.

December

Cleaning floors

Dust is at last recognized as a very common cause of ill health. The dusts from stone, metal and glass works, from coal mines, cotton mills and other dusty labor cause diseases having special names. Tuberculosis has been called "the house disease," which means that dusty housework has its bad effects. That the "house disease" is tuberculosis is because bacilli scattered by consumptives at home are not quickly killed by sunlight and fresh air, our houses shut out so much of them. Their shutting out also injures the general health, thus predisposing it to yield to disease germs, tubercle bacilli being the easiest to acquire.

It is said that one cubic inch of good country air contains 2,000 dust particles, and the same amount of city air contains 3,000,000 particles made up of dried manure and sputum, house and shop sweepings, tobacco, ashes, soot, particles of

iron, glass and stone. Schools usually have also much chalk dust.

Professor C.-E. A. Winslow found 56,000 dust particles in a cubic meter of quiet city air, and 20,000,000 after a dust cloud such as we cannot walk thru the streets without encountering occasionally. In a cubic meter of air in a class room before the class entered 2,000 dust particles were found; 15,000 while they were in the room; 35,000 just after they had left. Teachers who have had their children make cultures of dust "before and after," and in corridors, playrooms, basements, have found janitors quite as interested as pupils—with good results.

There are very few germs of contagious diseases in dust, especially out-door dust. They are usually destroyed by drying and light in a very short time, and widely scattered by winds. There are, however, many pus germs in all kinds of dust. An interesting account of what is known about this is just published by Professor C.-E. A. Winslow in the September number of *American Journal of Public Health*, 1912. The *Journal* ought to be found in any public library; but if it is not, the superintendent of health has it and it can be read with his permission, at the same time asking him to have the public library subscribe for the official journal of the American Public Health Association and keep it where it can be easily seen and read.

Dust causes catarrhal conditions of nose, throat and bronchial tubes by irritating them. These congested (irritated) surfaces are in the best condition for any disease or pus germs falling on them to multiply. In this way dust invites ill health, adenoid conditions, sore eyes, tuberculosis. Measurements of dust in city air should arouse us to better municipal housekeeping, cleaner streets and abatement of smoke nuisances.

To keep schoolroom floors as free as possible from dust that the air may be fit for children to live in is more important than to keep almost any other floor clean because the vital processes of children are more easily affected and the injuries are more far reaching; because children in greater numbers are affected during longer periods of time in a schoolroom than in any other kind of room; and because in almost no other room is floor dust so stirred up in the air as it is by the many restless feet, especially during gymnastics.

There are two points for mothers to keep steadily in mind in securing clean floors. The first is to see that the *floors are in a condition to be kept clean*. A floor that is rough, or splintered, or with large cracks, such as good housekeepers would not have uncovered at home, is unfair to have for children and teachers. Cracks cannot be kept clean, and splinters or other roughnesses make cleaning so difficult (almost impossible) that it is neglected.

The best thing for mothers to do is to cover such floors with a good linoleum, taking up a popular subscription if necessary, or a private one, to raise the funds. The agitation of itself will do much good. It will help educate people and politicians to the right of children to be well cared for and to one of the ways of doing it. The numerous bad school floors thruout the country could be put in practically perfect condition at once by a little outlay in each community.

It will give much more satisfaction to choose a linoleum of one color, not in patterns. The easier the dust is seen, the more of it will be wiped up. The good housekeeper's object is to find the dust and remove all there is of it out of the room as promptly and easily as possible.

Ferryboats, gunboats, libraries, hospitals and other structures where floors receive hard usage, or where cleanliness is specially wanted use heavy linoleums, some of them noiseless and fireproof. These are rather expensive at first, but I am not sure that in the end they are so—certainly they are not if estimated in terms of life as well as in dollars and cents. The ordinary inlaid linoleum is less expensive, and will last so long that a good quality of it is worth laying. I know a hard used school floor where it is just giving out after fifteen years.

A good housekeeper or "expert" should closely supervise laying it, seeing that no cracks are left,

especially at the sides, which the average workman almost always leaves. For the heavier linoleums there is a liquid crack filler that hardens in place. If laid to curve up against the walls and properly made fast, with concave corners fitted, there is less resting place for dust. The metal corners for sale at hardware stores are very necessary to have for corners of rooms and stairs. There are also concave moldings that can be laid along the sides of rooms where walls and floor meet so that dirt may be removed more thoroly and easily; for the easier, the oftener. In these and all the following details mothers have to take buildings already erected and make the best of them.

Mothers' clubs convinced of the fundamental importance of cleanliness in schools can find money to do these things in this age of generous giving and generous work. I know two or three teachers who have laid linoleum at their own expense—one more instance of these overtaxed and poorly paid women showing more intelligent appreciation of children's well-being than parents or school boards.

When this first condition has been secured, floors with smooth surfaces and concave meeting with walls, there come next the *problems of proper cleaning*. Good housekeepers all over the country unquestionably can have school floors kept as clean as their home floors, for a few janitors are doing it, and while doing it stir up only the very little dust it seems impossible to avoid.

One of the most interesting floors I have seen is in a crowded school in the heart of a smoky city. It was eight years old when I saw it, Georgia pine, and the yellow grain was almost as bright as if the floor had been laid that month. The janitor had never used water on it. He had always used a hair broom in whose wooden cross piece is a little reservoir containing a spoonful of kerosene. This escapes in barely enough quantity to keep the hairs oiled, but much short of dripping. Housewives know that a few drops of kerosene in dishwashing or laundering is an excellent cleanser. It is an excellent germ killer, too. Such a broom, therefore, intelligently used prevents much dust flying as well as cleaning thoroly; and the slight odor, as I specially noticed, was all gone before school opened in the morning after the sweeping of the night before.

I have askt other janitors why they do not use this broom. They replied either that they "tried it but it got out of order," or that they had not heard of it. No janitor should be appointed without mechanical skill to keep tools in order and to make simple repairs about the building.

A few janitors pin rough cloth (ingrain carpet remnants bought from factories at a few cents a pound) moistened with a mixture of linseed oil and turpentine, with perhaps a little paraffin added, around hair brooms and get admirable results, a clean floor that hardly soils a white

handkerchief rubbed on it, and this with the minimum stirring up of dust in the air when rightly done. Sawdust wet with water is not good, as minute splinters remain that make an irritating dust when dry. Even in stables and cellars it has this objection. Sawdust that has evenly absorbed a little oil and turpentine is more suitable for floors; other preparations also are used to moisten it, one being a weak solution of formaldehyde for disinfecting the floor once a week. It is important that the sawdust come in contact with every bit of the surface and every particle of dust on the floor; but often it lies in masses and little attempt is made to have this done.

There is one positive danger in using any of these methods for lessening dust. It is that some principals and janitors assume that *no* dust rises, or "not enough to do any harm." Janitors therefore sweep corridors, and even rooms, while schools are in session and children at study after school hours. I have more than once seen this done, the air being irritatingly dusty to anyone not determined that he would not see it—or would not admit it. My impression is that it is not a very uncommon occurrence. In such sweeping of corridors the claim that the doors of classrooms are closed and so it is safe to sweep is not to be tolerated; for sometimes I have seen one not closed, and frequently I have seen a child or

several people passing through corridors at the time of sweeping and entering rooms. All this is even more serious in common sweeping with straw brooms. Children and teachers are shut in and cannot help themselves. Mothers can stop it *if they will*.

The health officer of one of our states writes approvingly of a lawsuit against school authorities brought by parents whose child was undoubtedly injured by the unsanitariness of the school. He believes the quickest way of bringing school people into line with health methods is a few more such legal processes.

Wood floors properly scrubbed with soap and water as I have found them in a few schools are refreshingly clean and smell so; but even hardwood floors will wear rough and splintery with this treatment. One school with clean white floors, and fresh sweet air has one of its three stories scrubbed every Saturday in rotation, so that once every three weeks each floor is thoroly cleaned. Janitors ordinarily, however, think scrubbing floors women's work, and will not do it themselves. It is so hard and disagreeable that they pronounce it "unnecessary," and their opinion has prevailed.

Linoleum after sweeping with a hair broom preferably can easily be cleaned with a cloth slightly moistened with oil or water; or the oiled cloth can be used on the broom in sweeping.

One of the best helps in cleaning floors is to have either movable furniture, as a few schools have, or desk and seat with a single, perfectly round or oval standard having no crannies for dust to collect in and offering fewer obstacles to tools.

Floors should be left as dry as possible after using either oil or water. The odor of dirty drying oil or water should not be permitted, and the dried deposit is so much more dirt on the floor. Such a detail as this is not necessary to state to a good housekeeper, and is mentioned here to add point to the fact that with any good method must go competent supervision to ensure its proper use. School floors should be cleaned as often as necessary to keep them as wholesome as in well kept homes.

January

Last month suggestions were made for the cleanliness of floors in ordinary schoolhouses, such as mothers find have been erected by ordinary committees in ordinary communities.

But occasionally we see elaborate buildings, tiled floors and wainscotings, vacuum cleaners, a generous staff of caretakers who wipe away dust and keep surfaces bright thruout the day, as do

the maids in homes of wealth. These exceptions are costly and the all-round results are not always superior to what we find in much less pretentious buildings. Indeed, I fancy that under the stimulus of open air schools and school gardens these structures will be out of date before many years, and we shall swing over to less extravagant but more wholesome places where children will live a less artificial life as training for a saner manhood and womanhood. That word should be noted—"places," not buildings merely.

It seems desirable that wood floors should be abandoned in school buildings as they already have been in most fine public structures. One of the reasons is the greater difficulty of keeping them clean in comparison with smoother flooring materials. Even the latter demand intelligence and conscientiousness in the care of them. "Bat-tleship linoleum" promises to be as nearly an ideal flooring for schools as for hospitals and the navies of various nations. It will last for a quarter century, and can be easily renewed; is elastic, noiseless, waterproof and fire proof, not easy to stain, dirt does not grind into it, and it comes in a pleasant solid brown color; all this for not far from a dollar and a quarter a square yard. It is quarter of an inch thick, made of linseed oil and ground cork on a foundation of burlap under heavy pressure, with a smooth finish that is easily cleaned. It is laid by a special

process making it firm and free from cracks. Any large dealer in linoleums can provide the circulars telling about it. I have not seen it in any schools, but have seen it on ferry boats and in large public buildings, as institutes, office buildings, churches, hospitals—the last being the beautiful new children's hospital at the Johns Hopkins Medical School, at this date the most complete in every sanitary detail of any in any country. Here a kind of composition is used for the baseboards which curve down to the floor, meeting the linoleum. All cracks have the hard filling that has been mentioned. It is good to find at this hospital every roof, both of the various wings and of the main part, utilized for outdoor wards and outdoor sleeping and play.

Whatever the floor may be, a committee of mothers should watch their condition in a co-operative spirit, as some mothers' committees have helpt in the matter of school lunches.

Lavatories and basements

The standards of cleanliness for water-closets, washbowls and basements should be, also, as in the best homes. Perfumed "disinfectants" should not be permitted. They do not disinfect. Odorless air should be insisted on. Whenever I have enquired how some specially clean and fresh smelling public or institutional water-closet was

kept so, the caretaker's reply has been "Plenty of strong soapsuds."

A few pages back a janitor was spoken of whose interest in a handsome floor and kerosene broom proved what all janitors could do if they would. He was not an all-round good janitor, however, for the odor greeting one on entering his building was of urinals that were easily located by following the scent. It was not entirely his fault, for they were wrongly built at first, and no one had cared enough about it to alter them. Fancy the mother or father of one son in a forty thousand dollar house who would let such a mistake go eight years—or eight months! But here were only—thousands of everyone's sons and daughters under the care of the city fathers.

The condition is true of many schools, and, indeed, of the science (!) building of a famous New England university. Befoulment of the air is not the most important result of these dirty water-closets. The uncleanness of which the odors warn us may be accompanied by contagious disease germs, such as the gonococcus freshly deposited, or typhoid bacilli, and others. Medical inspection is discovering that gonococcus infection is occasionally found among school children and caretakers, as are typhoid, tuberculosis and other germs. They may all be communicated by use of common towel and water-closet, as they are by sleeping with or being cared for by

infected parents and nurses. Altogether too few schools make sufficient provision for hand washing after leaving water-closets, one of the most needed habits to cultivate in this country among children at school and at home. Some schools are providing paper hand towels for washbowls; others require each child to have its own towel and to be responsible for its laundering. It should be held criminal to have either a common towel or common cup. The method of supplying tissue toilet paper is also another subject for mothers to attend to. There are odd ways.

In country places where outhouses are used the same standards of cleanliness must in some way be secured for the good of the children. There is here the additional problem of flies that carry filth from the vault to every object they light on, children's faces, books, luncheons. The house fly is being called the "typhoid fly" as it is known to carry bacilli from typhoid discharges to the well. It is coming to be well known that the Japanese in their war with Russia lost almost no soldiers from typhoid fever partly because they covered all excreta away from flies, filth carriers. They proved better sanitarians than the Americans in the Cuban war who left their trenches open, as many schoolhouses still do, and lost many more men by typhoid than were killed by the enemy. In "American Schoolhouses," a bulletin of the Bureau of Education that should

be in the public library, mothers can obtain further information concerning this detail of country schools. They should see that vaults are cleaned frequently and kept well sprinkled with lime; but if any residences in the vicinity have modern plumbing, why not the school-house?

The common cup: emergencies

Our topic is clean schoolhouses, and it is fair to call the common cup a part of the schoolhouse since it is chained to the wall.

The sooner mothers insist on its banishment, the safer their children will be from other children's sore lips, sore mouths, poison of decaying teeth and sore throats. The germs of tuberculosis, diphtheria, scarlet fever, measles, pneumonia, and other disease germs are often in the mouths of the well. These children and people are called "carriers." Dr. C. V. Chapin and others have shown that contact with these "carriers," as by their saliva on a cup, causes many illnesses. Before children are known to be "coming down" with a contagious disease their saliva may be left on the cup for the next user to drink.

Specialists who have examined school cups find under the microscope thousands of cells from the skin and lining of the mouth, with thousands of bacteria clinging to them, some of the

bacteria being those causing illnesses. The lips and saliva when a child is drinking always touch the cup. Every "catching" thing one child has who uses it those who come after him are liable to get. It is truly astounding that, well known as this is, there are hundreds of schools, yes, thousands, from New England to the Pacific still using the common cup. It is eloquent testimony to the indifference of American fathers and mothers to the welfare of their children.

There are two books the public library should provide for mothers' clubs to use in this connection. One is Dr. Chapin's *Sources and Modes of Infection* where can be read the latest facts that are discovered about "carriers," whether they are well or ill people, or insects, or water or milk. The living germs conveyed by these carriers cause illnesses. Time, drying and sunlight kill very many bacteria in a few hours or days after they leave the carrier; a few others may live for a month or longer. So that it is really contact with people more than with things that is dangerous. Touching the fresh saliva or any other discharge from people is practically contact with them.

The other book is *The Human Body and Health* by the professor of biology at Lafayette College, Alvin Davison. The illustrations on pages 261, 263 and 265 are true reproductions from life of what anyone looking thru a microscope finds that people leave on drinking cups. Whether or not

the text is read, it does not seem possible that any mother after seeing the pictures can allow her child to use a common cup at school, or on a train, or at a public fountain.

But must children go thirsty? We have already discust some of the reasons why they should have plenty of water. They need not go without it so long as they can find a piece of paper eight inches square. Even clean newspaper is safer than the common cup; but a piece of fresh writing or wrapping paper would be better. Of course there are "germs" on clean paper, but in all probability not disease germs.

Fold the square diagonally. Next fold the two distant corners over on opposite sides until the tips touch the opposite edges; crease them down; separate the two layers of the middle corner, crease one over in one direction as far as it will go, and the other over in the other direction. If, now, the two edges left are opened with the fingers, there is a substantial cup for one or two "glasses" of water.

Get the teacher to have all her children make paper cups. They are likely to find it the most interesting lesson in "physiology" they have ever had, for she will explain the reasons for individual cups while they make them. They can use cups until the city fathers make up their minds to put in bubble fountains or faucets by which children can drink from a little jet of water without touching anything.

Kansas, Michigan and Mississippi first adopted regulations against the common cup in schools and railway trains (1909).

Massachusetts, Wisconsin and California were the first to enact laws forbidding it in schools, on railway trains and in other public places. Two winters ago (1911) it was amusing to watch passengers on trains from Boston turn away from the cupless watertanks; but when the Rhode Island border was reached the common cup was brought out, and all the way to New York, Philadelphia and Washington every user—! Mothers even put it to the sweet lips of their babies! This winter, however, it is equally entertaining—and encouraging—to see how, law or no law in the state thru which the train is passing, nearly every passenger has his own cup.

Professor Elizabeth Gaines of the department of biology at Adelphi Academy, with many school teachers, began using the paper cup we have described during epidemics of diphtheria and scarlet fever in Brooklyn, and led in another movement that mothers' clubs could undertake in their own communities where the feather duster, common cup and dirty, badly ventilated schoolrooms exist. The New York School Hygiene Association of which Professor Gaines was president sent to the Board of Education a petition signed by parents asking

1. That the common drinking cup be abolished in the schools, giving facts and the reasons.

2. That the feather duster be abolisht, moist sweeping be required; and better methods of cleaning and ventilating be provided in new buildings, giving facts and reasons.
3. That specific rules for cleaning be made by experts, and janitors be required to observe them, using some of the arguments from the preceding pages.
4. That better provision for class instruction in hygiene be made.

Soon after the Brooklyn schools began using the paper cup an enthusiast sent about a thousand New Year's greetings with the cup anonymously to as many health officers and school men. Pretty soon it appeared under the name of the "Dr. — cup," and a little later differences of opinion arose among school men who wanted to patent it! Of course its real value is that children can always make their own cups wherever they may need them. Apparently the paper cup is a valuable sanitary asset.

One superintendent writes: "I hope the time will come when we can have the sanitary drinking fountain in all the schools. Until that time, this seems to be an excellent and inexpensive means of meeting the serious situation presented by either the common drinking cup or supplying the individual cups of the ordinary type. I will see what can be done to encourage the making and use of this paper cup." The objections to children

having their private cups are that they do not keep them clean, and lending a cup to a thirsty friend is a courtesy that teachers cannot quite so easily criticize as they can "swapping chewing gum." Unless one knows something better, this extemporized cup is a good makeshift anywhere to avoid public cups. *The common drinking cup is dangerous.*

February

Walls and windows

The worst schoolroom walls I have ever happened to see were not long ago in a famous state with four syllables in its name, and in a few places just over its borders—not always obscure villages, but in at least one large and often-heard-of school. They were papered walls (ugly paper, too, incidentally) and sometimes two or three layers deep, with torn and loosened fragments.

Good housekeepers have old paper removed and walls cleaned before the new is put on. The pastes and papers absorb odors and dampness, and lodge molds, vermin, micro-organisms and dust, affecting the atmosphere of the room more or less. These papered walls are as bad as what I omitted mentioning having seen in talking about

clean floors—carpeted kindergartens. In three schools I have seen ingrain or brussels carpets put down because the floors were splintered, or because in some games the children must sit on the floor and it is cold in winter or “so very dirty.”

The fact should be recalled that the younger children are, the more rapid their vital processes; they are growing faster; therefore the effects of dust inhaled are more far reaching, one of the reasons for the increase of tuberculosis all thru school life, and for the so-called “school fatigue.” They should have the best surroundings like the high school, not the dirtiest. The same process of reasoning also applies to the quality of teaching.

The smooth easily cleaned linoleum that has been advised for splintered floors would be cold, too. There might be experimenting with art squares that can be hung out of doors and beaten every night, and not laid until just before school opens, with properly adjustable floor fastenings. But with the many health difficulties and practical difficulties perhaps normal children can be better grown without “floor games.” Or we might learn lessons of the clean floors of Eastern races who do not use chairs, who sometimes use rugs also, and put off their street shoes at the entrances of their houses.

To return to school walls—they are sometimes defaced by scribbling, handmarks and other spots of several years standing, especially the

water-closets. Some walls are so dark in color that light in the room is lessened and children weary from efforts to see; or so pale and white with bright windows that eyes are dazzled and nerves are tired. In both cases permanent injury to the eyes is liable to result, if not to the nervous system. There are broken walls and ceilings, adding to the dustiness; and rough finished walls, every little projection a settling place for dust that slight air currents start floating again in the air children have to breathe.

Mothers have no more moral right to allow government authorities, committees or any other power to place their children in surroundings that injure health than they have themselves to keep such surroundings. Mothers are responsible for knowing that the environment is a safe one. So are fathers. If an unhealthful one, the fact that school authorities keep it so does not lessen parents' duties—each parent's—to prevent it. The duties of parenthood cannot be shuffled off on paid or elected officials. Parents must still hold such officials up to the duties they are paid or elected to perform—in this instance to develop potential fathers and mothers with healthy bodies, minds and ideals.

Mothers' clubs, better than an individual alone with no backing in numbers, can study the cleanliness of a school and "make the best of" bad floors and bad walls by intelligent effort. Except

in the nine equal suffrage states mothers have rather helplessly to take things as they find them and make the best of them, as they have long had to do in poorly constructed and finisht houses—not a bad training of the wits for bettering school conditions. *Only one needs to be sure that the proposed change is really an improvement*, and does not add more details for overworkt teachers to see to.

It is not a great expense to remove wall paper (wetting it first to prevent dust flying and to save the workmen from it), clean and paint the walls. Oil paints are always at hand; their application is understood everywhere. Smooth painted walls can be washt; wiped down with dry mop to remove dust; they are non-absorbent and durable. The glossiness of some paints should be avoided, for like the glossy printed page, it is bad for the eyes. There are numerous tinted washes also, some less expensive than paint, as easily applied as paint or more so, their re-application being no more work than washing painted walls.

Ceilings should be white, thus sending more light down to the desks; but white walls are trying to the eyes in a strong light. In sunny bright rooms walls of pale green, a very pale gray green, not a hard yellow green, are artistic and restful to eyes and nerves. In north or darkish rooms pale buff or écreu reflect a sunny light. It is worth while to consult some one with a fine eye for

shades of color (mothers supplying the sanitary ideas), for a profound impression on good taste as well as on health is made by children's school environment, even by the tint of walls. A beautiful shade need cost no more than a crude one.

Whatever the colors, good school housekeepers will see that walls are kept clean and dusted as necessary, either with dry mops or with soft absorbent cloth fastened around brooms. Some walls need cleaning oftener than others for reasons explained further on.

Decorations also are a problem in wall sanitation. Many walls in rooms of the younger grades are more or less covered with paper festoons, greens, banners, drawings on paper by the pupils, etc. These temporarily in place serve their immediate good purposes; but should be carefully taken down after a week of dust deposits and removed out of doors for cleaning if any are to be preserved. Much of this is not the kind of decoration for which we wish the country to acquire a liking, and it soon becomes unsanitary.

A few good pictures, pictures with a mission, or even one, placed in good light, framed in natural woods with soft finish showing the grain, can be easily dusted, and, if chosen with good judgment, can be used to interest and educate children in health ideas still further. Often one sees pictures that provoke the question, "Why *here*"; pictures that the pupils and sometimes the teachers know

nothing about, or next to nothing. They have been seen daily, but with "eyes that see not."

I have often wisht that there could be placed in a few hundred schools a large portrait of Pasteur, with the story of his life (that is as fascinating as a novel) in the school library, and then see what would result if mothers' clubs stimulated questions year after year about the man and his service to us all. It could be made the means of creating as high ideals of patriotism by right living as portraits and stories of Washington and Lincoln.

History and science are both more alive to children when some one or some thing "stands for" either. A portrait of Walter Scott leads from his "life story" to history and good fiction; of Maria Mitchell, to the greatness of the universe outside the earth and to the affection and possibilities in plain living and high thinking. If a picture is worth room on school walls it should be a means of right education, since it inevitably has an influence, and much study can be put in selecting one.

Windows should be washt at least three times during the school year, with water in which is a little kerosene, which is cheaper and gives an easier and more lasting clearness than sand soaps or other soaps that after the first rain are often followed by streaks and cloudiness; kerosene is also more comfortable for the hands in cold

weather. These washings should come in September and late December, just before schools open, and in February. The spring months invite open windows and have more light, so that when more than three washings are impossible, these months are safest for omitting them; also, sunny rooms with bright light can be safely omitted when necessary for the sake of north and poorly lighted rooms, whose windows must be kept constantly clear.

Eyes are worked by tiny muscles controlled by nerves running to the brain. Just like any other muscles, if these are strained by trying to do their work under bad conditions they get out of order and defects of vision result; and just like other nerves, if the will forces these to work under difficulties—too little light or light of a bad kind, they become exhausted and other defects of vision may result.

There is a close sympathy between all parts of the nervous system, so that when the feet are tired, for example, or the ears from listening to the racket of machinery all day, we “feel tired all over.” In the same way tired eyes make children tired all over, and permanent defects in vision cause them to tire more easily, possibly to have various nervous disorders, headaches or indigestion, that wearing suitable glasses will sometimes relieve; but the child is handicapped for life. This also is a part of “school fatigue.”

Those who damage children in this way should be punishable as are street car companies or factory owners when life, limb or health is lost because suitable precautions are not taken. Neither means to do the harm, they state; but—I have just come from a new school building one side of which is so shaded by the neighboring structure that the gas was lighted all this slightly cloudy morning. The harm that this is doing can never be undone by explanations of officials—the same that the voters elect year after year and do not call to account for such an outrage as this. With our abundance of land, of light and of good air, there is no right reason for depriving children of all they need for health.

Windows sufficiently clean to allow ample light to come thru are then a factor in health. Much depends on the adjustment of shades, which must not allow direct sunlight on the desks or reflected from a light or glossy surface into the eyes. The best light is had when shades pull up from the bottom, letting a diffused light pour down from above; but they are little used. One girl said, "They make me feel lonesome." They may produce a shut-in feeling, but this is not a good reason for not having them.

March

An interlude

While these chapters are going into details of schoolhouse keeping necessary to provide good air for children, another method of securing it is growing fast, and will profoundly modify school methods, I am confident, both in the direction of health and of economy as well.

In memory of their little daughter of twelve years who died, a Chicago father and mother established a fund for the benefit of other children. With the income several wise movements have been aided, but none better or greater than the movement for open air schools, which began in Providence a few years ago.

Dr. Ellen A. Stone and Dr. Mary S. Packard, after a summer's experience with a play school for delicate and tuberculous children on the shady southern lawn of the former's home, secured the consent and cooperation of the superintendent of health and school committee in taking out the whole southern side of a schoolroom and opening the first "Fresh Air School" in this country. Many such rooms better than this one now exist in different states, and they are multiplying rapidly; but "*c'est le premier pas qui coute.*"

A charming little book, illustrated, has just been published, "Open Air Crusaders: A Report of the Elizabeth McCormick Open Air School," with this dedication: "To the memory of Eliza-

beth, Daughter of Mr. and Mrs. Cyrus Hall McCormick, a child whose radiant young life was so marked by deeds of kindness to others that these ministries of love were not allowed to cease when, at the age of twelve, she was called into the presence of the Great Friend of all the children."

There is no healthier philosophy than this—to multiply one's own work for good so that the ministries of the lost one may not cease.

The title page states that thru the generosity of the trustees of the fund the United Charities of Chicago is enabled to place this book before the public free of charge. In reply to a letter asking whether the demand would be too great if the secretary of every mothers' or parent-teacher association asked for a copy, the General Superintendent replied: "We are anxious that it should be put to the widest possible use, and I can think of no way in which it would more quickly reach the very persons whom we are wanting to interest in the work than by the suggestion that mothers' clubs and parent-teacher associations make it the subject of discussion. We are prepared to meet a reasonably large demand for the book." The first edition was exhausted in a few days, and now many more have been issued. It can be obtained for the asking by addressing the United Charities of Chicago, 51 LaSalle Street.

A program whose speakers are a medical in-

spector, school nurse, and the superintendents of health and of schools can bring this very important advance before the friends of a mothers' club. Where the subject has been already discussed, but there is not yet an open air room in every new schoolhouse planned, and in at least one old building in every neighborhood, then it should be presented again with the determination that something more than mere talk shall follow. There are occasional mothers who have for their little children of about kindergarten or primary ages a "home open air school," and near by mothers are delighted when permitted to send their own children to these happy places.

Mothers have a large measure of responsibility for the bad conditions in so many schools, even when they have not the power to discharge their responsibility effectively. But all are soon to have this power. The signs of the times are unmistakable, and there is no higher law resting on them than this of responsibility for children *wherever children may be in the community*—home or school, street or work place, place of entertainment or of recreation.

April

Streets and housecleaning

A Chicago mother wrote me not long ago: "I have found rooms 74° and 76° and even 82°, and the teachers wearing 'peek-a-boo' waists, while the children wore woolen underwear and dresses suitable for winter in this climate. Some schools use soft coal, and we have to strain the air. I put cheesecloth over the open bedroom windows with thumb tacks. There is a school where the in-take for air is over garbage pails of families living across the alley; the outlet is over the girls' playground!"

This all reads true, for one can find the like in other places. The good thing here is that at least one mother has cared, and I have no doubt she has made others care, too, since she has been so wise as to look into conditions. Evidently "clean schoolhouses" require attention to other details besides floors, walls, windows and furnishings.

Cleaning school buildings is made unnecessarily difficult, even useless sometimes, by certain factors outside the building. Dirty streets are one. Streets are unnecessarily dirty because they are either badly cared for or badly made. Their dust as every housewife knows, can in a few blustering hours entirely undo wearisome and expensive labors.

Such dust is brought in on children's shoes, or

blown in around windows and doors or through the cold air box of the furnace. It is, as has been said already, made up not of sand alone, but of dried manure, sputum and other animal waste, of house and shop sweepings, ashes, soot, particles of iron, glass, tobacco and other vegetable material. It contains but few germs of tuberculosis and other diseases, and abounds in pus germs.

These irritating and poisonous particles drawn in thru nose and throat irritate and poison the delicate mucous membrane lining of nose, throat and bronchial tubes, causing much catarrhal trouble. Physicians whose specialty is diseases of nose and throat look for many more cases of "cold in the head," "sore throat" and bronchitis after wind storms; chronic catarrh is aggravated in dusty weather. Adenoids and adenoid conditions, tonsilitis, tuberculosis and some other germ diseases that affect the respiratory passages develop more easily in this catarrhal tissue. Autopsies show that city dwellers' lungs, instead of a healthy pink, are more often a dirty dark color like the lungs of those working in coal mines and in other dusty occupations, with fibrous thickenings and nodules where more or less inflammatory changes have taken place. These inflammations are not enough perhaps always to make people ill in bed, but they lessen vitality and predispose to disease.

This is one of the reasons why country life,

"other things being equal," is healthier than city life where fifteen hundred times as many dust particles float in the air we breathe. We have spoken of the high death rate from tuberculosis among teachers, and the very large amount of tuberculosis among children that increases thru school years, except among "open air school" children. This street dust trackt and blown in is an important part of such ill health, altho not the whole cause.

Streets can injure health in another way, as we found in our study of school fatigue last year. I know a school placed in the sharp angle between two streets paved with cobble stones over which heavy wagons travel. The noise is so great that teachers unconsciously develop unpleasant voices in their efforts to be heard. Both teachers and pupils feel the strain of this almost continuous bombardment of their ears. Noisy and dusty streets around schools are common.

We must aim to have some day soon every school in the midst of grass, trees and gardens—children's gardens which they care for as a part of their education. We have the land, the money and the children—everything but the intelligence to so adjust them as to bring it about. This will come after a few thousand—or must it be millions—more lives have been sacrificed in teaching the lesson. We shall arrive.

Meanwhile superintendents of streets, public

opinion and politics must be won over to the cause of dustless, quiet highways around homes and schools; it is also possible to have them around many business places as a few are showing. Mothers' clubs can do much to help this along. One meeting every year with speakers from among those directly working in the department of streets of the local government, as well as from among those interested in the health and in the housekeeping sides, with a good account of it in the newspapers, and with an active committee that pushes the matter along even when not on the program of a meeting, will accomplish things worth while. Talking merely is not enough.

One topic might well be, "What is the least dusty and noisy material for street paving?" It is much more interesting than it sounds. I remember a discussion on it among Boston physicians a few years ago that was published in the *Boston Medical and Surgical Journal*, August 2 and September 6, 1900. If it is not in the medical library of the city, or cannot be borrowed from one of the physicians, it can be bought for twenty cents sent to the office of the *Journal* in Boston. Mothers' clubs can make the subject so popular that sensible articles may be found more often.

Another good topic is, "Shall we have oil or water sprinkling?" Another is, "Shall street cleaning be allowed when streets are dry?" There are usually two sides (at least) to public questions,

and the wise club will hear both; but make up its own mind in accordance with the interests of the children and family.

Meanwhile, too, janitors with the extra work caused by bad management of streets are not only obliged to clean the inside of the buildings, but like other housekeepers need to devise ways for keeping out dust and mud. There is the problem of door mats. What kind wears longest, cleans shoes best, and can be kept cleanest? Several have told me that woven wire mats are best in these ways. Some janitors, on stormy days, have brushes at the entrance for cleaning shoes before children go in. The brush part of old hair brooms removed from the handle and cut in two brushes is economy and quite effective. Here is another condition that provokes us to ask about the Oriental custom of removing street shoes and putting on house slippers at entrances. Street shoes, long street skirts, and dirty streets are a trio of nuisances that must be replaced by clean practices.

Quite as important as the care of air after it has come thru the cold air box is the kind of air that comes thru it. There are cold air boxes drawing their supply of "fresh" air from the level of sidewalks and streets, and the pipe of the passing smoker is distinctly smelt in the house; if tobacco smoke, then of course, any other smell from passers-by is drawn in as well as dust. To

be sure there may not be disease germs in this air, but is it what it should be for children's air supply? It is not thought to be so, and architects and builders writing on the subject positively condemn such locating of the fresh air box.

Sometimes, as the quotation from the letter testifies, the air is drawn from alleys where garbage or other rubbish is kept. When cloth for sifting air is placed over in-takes it quickly becomes heavy with a blackish deposit. When air is washt by spraying or by showers of water in certain ventilating systems the washings make a muddy stream whose "mud" might have gone in children's lungs instead, as much goes. Builders of schoolhouses say such systems should always be used in soft coal cities, but are not so necessary in anthracite cities; nevertheless several pails of dirt—five I am told—were washt out of the air in one week in a Brooklyn school standing in a good neighborhood.

This leads us back again to the cleanliness of streets and byways around the school. If any mother does not know that the conditions are as they should be around her own child's school, perhaps those five pails of dirt may interest her to find out. It is tempting Providence to comfortably assume in the face of such facts that officials care so much more than mothers about mothers' own children.

Or it may be that the school yard itself is at

fault. Does the outlet for bad air empty in the playground as this letter reports, or in some other place where children get it directly? Is it a muddy yard, or in some other way not fit for children's use, and giving them a low ideal of what the surroundings of the place they live in should be? If so, mothers' clubs can "attain merit" by putting it in good condition, as many clubs have already done, and by encouraging children to do as much of the work themselves as possible, and to keep it as it should be. Some cities, Cleveland for example, have beautiful settings of greenery for all their schoolhouses in which children take great pride and for whose good condition they feel responsible. Most school yards are ugly. It is not always money so much as it is brains that is needed. Working on such an improvement helps arouse interest in the need of larger, much larger plots of land around schools.

Another not uncommon cause of schoolhouse dirtiness is its standing directly in the path of the prevailing winds bringing smoke from a factory or other chimney. This increases the labor and expense of keeping rooms and windows clean; or, which is more usual, they are not kept clean, and health suffers—a greater expense in the end. Some such chimneys also send out injurious gases and disagreeable odors. There are methods of preventing all these defilements of the air we live in—or die in. In a few places there are laws

requiring these methods to be used, but they are rarely well enforced. Just as city fathers allow saloons, houses of ill-fame and the evils always cropping out in their neighborhoods to educate many children more hours in the year than do our schools, so they allow dirty streets and business methods to injure their physical health in the ways we are considering.

There are American cities actually boasting of the clouds of smoke overhanging them as a sign of prosperity! It is, instead, testimony to being behind the times. The blacker the smoke, the greater economic waste, and waste of public health as well. It is entirely possible to have city air free from smoke. We must have suitable legislation, health boards with power to enforce these laws, and strong public opinion which mothers should help in creating to keep health boards up to their duties. Some useful facts are to be found in "The Cure for the Smoke Evil," by Herbert M. Wilson, Engineer in Charge, U.S. Bureau of Mines, published in *The American City*, June, 1911. The number also contains an article on baths.

Clean streets and other surroundings are really problems in city housekeeping, and seriously affect housekeeping in homes and schools. Indifference, ignorance or incapacity in city cleaning waste an incalculable amount of labor, time, health, happiness of those who try to keep homes fit for growing citizens.

*May**Schools and social centers*

Besides dirty, bad smelling streets, byways or yards, or lawless factory owners and incompetent officials who allow these things, there is also another item from outside that calls for foresight to avoid its complicating the difficulties of clean schoolhouses.

It is becoming known under the propaganda for "The school as a social center" or "neighborhood center," or "Wider use of the school plant." It has so many good reasons for its development that unless thinking people keep certain essential rights of school children in mind, it will do much harm that can be avoided by reasonable foresight in the beginning.

We have approximately one billion dollars invested in public school property, costing us annually over \$341,000,000 to operate. We use this expensive department of the government not more than six hours daily for 155 days, about 930 hours annually, less than a third of the time any ordinary shop is open.

Many of our large business undertakings, especially those of public utility such as trans-oceanic or trans-continental carriers, employing eight-hour (or other) shifts of men, operate steadily twenty-four hours, 365 days in the year. Others lie idle Sundays only, or Sundays and nights. Others go on for eight, nine, ten hours,

six and a half days, for fifty two weeks in the year. The contrast between the management of our immense public investment in schools and that of private investments of even small amounts, or that of some other public departments is great.

Idle buildings and idle rooms in buildings have contributed to the apparent reluctance in some instances with which appropriations for more buildings or for running expenses have been granted. Thriftiness in these respects has seemed lacking. It is wasteful not only of money, but it is wasteful of opportunity to meet urgent public needs. Except church property, which is likewise idle the greater part of the time in spite of the increasing demand for better moral education, there is almost no investment in buildings lying unused so large a proportion of the year. It is worth more than passing notice that in these two costly institutions so many people seem to like getting so little for their money. The more holidays and the shorter hours, the better.

These economic facts, together with the need of meeting places for the population not in day school, have led to the advocacy of using school buildings for other than day pupils. Evening schools and summer schools are becoming a part of public school work and belong regularly in the problem of school sanitation.

There are, however, certain irregular meetings that have not so belonged—special political,

scientific, educational, philanthropic and social meetings. Each succeeding year a larger number of these are held in school buildings.

If such meetings do not detract from the regular educational uses of the buildings, they should be encouraged. But it is important to answer now, in the beginning of this innovation, the question, "Is the use of school buildings for other than day and evening schools in any way detrimental to these schools?" If it is so, in any way, the harm must be stopt. We have already to make right enough mistakes affecting children, of long standing in the schools and in the community, without injuring them further by additional ones. Schools have been their special sanctum, the one place where professedly their rights are dominant.

From my own limited experience the answer to the above question is undoubtedly yes. Such use of school buildings in some instances has been injurious in the matter of cleanliness (healthfulness), altho it is not inevitable that it should be so. In widely separated localities I have found the following examples of gross violation of children's right to have clean rooms:

A political meeting Saturday, with the building dirty and smelling of tobacco smoke Monday.

A monthly meeting during several years, with rooms regularly saturated with tobacco smoke during the next day.

A regular monthly banquet (after literary

exercises), with fragments, crumbs and the odor of food in evidence at school the next day.

Occasional lectures or entertainments, with the noise, dust and interruptions of preparation during school hours. Children's own entertainments create enough of this.

Floors not swept after public meetings and in a condition such as no good housewife has at home.

Dried expectorated tobacco juice.

Dried sputum.

These items lead one to wonder further how clean were the hands that left their memories on the children's furnishings.

It should be said that there was no auditorium in any of these schools. The public used the classrooms. It would be absurd to claim that these instances are all that have occurred, and I doubt their rarity. Teachers understand that in these matters, as in the regular conduct of sanitary affairs, consistent and effective complaining on their part makes them disliked and so endangers their positions. Therefore they suffer the consequences with the children.

These examples of conditions already resulting from public use of school buildings are a fair warning that we should provide a very much more intelligent and efficient care of rooms than we have hitherto provided, and should do it before the children are subjected to the conditions, instead of

after. They warn us that we may expect, if we do not do this, that the greater use of the school plant is to thwart our efforts in prevention of tuberculosis, nervous disorders and other forms of ill health that have been invited by public schools in the past.

It is apparent that in this wider use of the school plant by the public we are liable to infringe on children's rights in the schools as we have in so many other places. We have built cities where they must live without safe spaces for play—the child's normal method of character and health building. We have churches with the children an after-thought in the hands of unstandardized volunteers, and very likely in a dim and unattractive basement. Our theatres, literature, press and streets abound in evil lessons for children. The majority of homes provide food, hours, rooms and amusements for adult tastes, neglecting the things good for children.

In view of these tendencies any slightest further overstepping of the rights of children in the single institution primarily dedicated to them is a matter for jealous watchfulness. Mothers' clubs should be trustworthy guardians to detect and prevent it.

It is the greatest pity in the world that our thousands of empty, idle, untaxed church buildings should not be used for all kinds of decent adult meetings. Our courthouses, the assembly and

committee rooms of city hall and statehouse are public property, as are often the lecture rooms in libraries, museums, art galleries and the like. There are many places built for public use by adults that are unused evenings and Sundays. Use them.

III

SCHOOL JANITORS AND HEALTH

"Every sanitary precaution necessary in private homes should be enforced many times more rigorously in school-houses."—"American Schoolhouses," Bulletin United States Bureau of Education

October

A billion dollars and all our children

The *motif* in *Prevention of School Fatigue* is the imperative duty of cooperation between parents and schools in health details for children, especially on the side of mothers.

In the discussion of *Clean Schoolhouses* is urged the responsibility of mothers for the welfare of their children *wherever they may be in the community*, with special reference to the housewifery in our schools. Mothers cannot safely shuffle off this God-given responsibility on teachers and political officials, nor can fathers, as is shown by our mortality and morbidity rates among children.

Women, by general consent the "home makers" and "housekeepers," are guilty when shutting their eyes to and withholding their labors from

any dirty, dusty, bad smelling, overheated school-room provided for our potential citizens and parents during the best waking hours of their most plastic years.

Ignorance of the sanitary conditions surrounding children is no excuse. Nature's laws of life and death do not recognize it as one, but continue on their way, blighting here, cutting off there, until parents shall learn the lessons whose tuition fees are paid in helpless lives, heartaches of guardians not equal to the trust, and society's loss of the service that might have been received in return for intelligent—cleaning of schoolhouses; such sweeping, dusting, scrubbing, heating, ventilating, disinfecting, deodorizing, as all good mothers know homes must have for health's sake.

I first read the sentence heading this article when feeling particularly sceptical about mothers' clubs. I had just been (1912) in a city where I saw in its expensive ornamental normal school building a Chipt Rusted Cup chained to a water faucet, mixing salivas of all sorts of people in their drinking water; this being the instruction in practice to the supplementary mothers, the teachers, who are supposed to be trained there to guard safely the lives committed to their care.

In the principal square of the city was a drinking fountain with a Chained Cup where I saw men and boys mixing poisons and diseases. All three school buildings that I visited had The Common

Cup also, with the usual other insanitary practices that go with this filthy one.

And the boast of this municipality is its wealth.

But the most discouraging part is still to tell. This city has had for several years two large and over twenty small mothers' clubs. Some of them know what Professor Davison's pictures show on The Common Cup, and know that all sanitary authorities as well as their own good sense consider it the nastiest habit we force on children (and the public), one of the usual causes of tuberculosis, syphilis, and every other disease whose germs lodge in throat and mouth.

The clubs' programs are engaged with—well—Child Psychology, and neglect the elementary cleanliness that makes the good blood necessary for the brain to work rightly. They talk about Stories for Children, and Books for Children, and Play for Children, and give children The Common Cup that so often ends the need for stories and books and play.

If they would spend on The Common Cup the energy and money given to getting out one year's program, they would justify their organizing, as the program alone—words without works—does not. To screw on a little bubble faucet in each school, not forgetting the pretentious normal, would save years of life—“*monumentum aere perennius.*” One member replied to my letter of grief: “Mrs. —— is the wife of a member of

the board of education, and is our chairman. She would be much offended. We have talked these things over among ourselves, and I think something should be done, and perhaps might be if we tried." I wonder whether all the sins shifted on "politics" really belong.

I wonder, too, when educators don't, and "politicians" (fathers under another name) don't, and mothers don't—I wonder whether trained janitors would. Trained nurses bring about many good things that doctors and politicians and parents did not accomplish before we had training schools. So do other trained workers in their own fields.

We have more than a billion dollars invested in school property, and we are just now spending about \$70,000,000 annually in erecting new school-houses. The care of all this we put in the hands of men to whom we pay approximately \$30,000,000 annually, not one of whom (if, by chance there is one, it is the exception proving the rule) is trained in sanitary care of school premises before his first appointment. What they have is pickt up information, the kind of knowledge nurses had before training schools were establisht. What they do is not what good housekeepers allow in their housewifery, and is measured by our vital statistics and educational statistics. The officials superintending them, also, are not trained for their duties.

But this is the least of the cost. We, knowing that schoolrooms do not come up to the standards of the best kept homes (and some of our best kept homes in respect to health are among poor people), knowing that dust, light, heat and air and disease germs are under caretakers with no special training, few standards and little supervision, just as it was with our nurses sixty years ago—we place in these school homes the health of practically every citizen at his most critical age—that of rapid physical growth, the age of laying foundations of intelligence and morality.

We are frequently humiliated by learning how poorly our vital statistics compare with those of some European countries as well as our statistics of crime, illiteracy, degeneracy, alcoholism, and recent poverty. Among the lessons we find in those countries bearing on the concerns of physical life is one that several educators and other travellers have commented on, that schoolhouses in Germany and elsewhere are much cleaner and more sanitary than they commonly are with us.

We train and test for efficiency, in other words we standardize to some extent many other kinds of civil service in which not so much money and not nearly so much of national well-being is involved, and we do it in many kinds of private service. We pay janitors in many cities at higher rates than we pay elementary teachers who

spend so much time, money and effort on preparation and are regularly tested.

Attention has already been called to the death rate from tuberculosis among teachers being higher than the average of all other occupations. In the administration of teachers' retirement funds it is recently reported that only one-tenth retire because of age. The other nine-tenths give out because of physical and mental inefficiency, nervous troubles and similar forms of ill health.

Among children there is a group of ailments long recognized as "school diseases" of which we have already spoken. They are chiefly anemia, nervous disorders, heart troubles and defective vision. It is now generally known that tuberculosis increases thru school years and after until in the twenties and thirties, the years of marriage and parenthood, it is the commonest cause of death. We have also referred to the fact that it is latent in very many children, and liable to become active on any slight depreciation of the general health.

That conditions of schoolrooms promote these national and local mortality and morbidity rates has one proof in open air schools. Here, doing the same work under the same teachers, every delicate, anemic, tuberculous, nervous, backward (selected) child, with no exception, has improved in health, also in school work and often in grade, at a more rapid rate than children in regular

classrooms. These "occupational diseases" of schools are fostered by too high temperatures, too dry, stagnant, dusty indoor air.

November

The great test

One test of the quality of janitor's work is the health of teachers and children. There is another very sensitive measurement of their work and of the sanitary conditions of schools.

Schools do not exist simply to turn out children from their grades, or fit them for college, or train them to be good money makers after leaving school. The true object—even if not yet generally realized—is to make good mothers and fathers of better children.

The largest part of our strenuous social efforts to lessen the world's misery is directed against the unfitness of parents. Some of this unfitness is poor health. Some is ignorance of healthful ways of living, or it is wilful disobedience to laws of health partly due to the tyranny of lifelong bad habits.

The most sensitive measurement of the sanitary conditions of schoolrooms is the *rate at which babies under one year of age die*—what we call our

infant mortality rate. This country stands far ahead of other civilized countries in national wealth. It stands, also, very high in crimes against life. There is no country with such terrible records of industrial accidents and railway accidents; no country with such a rate of suicide and murder. Nearly half of the suicides that have occurred in the last fifty years have been in the last ten. In some years we are having about 11,000 murders, the average is over 6,000 every year, and we convict less than two murderers in one hundred. Germany convicts ninety-five in every hundred, and has few such crimes in comparison with us.

The lives lost in any celebrated battle of history were few compared with those destroyed annually by violence and by preventable diseases. This year will be the same. We anticipate it quietly. But if a battle at Lawrence, for example, in connection with the strike had killed—two—or ten, it, too, would go down in history. Some day we shall turn to the mortality records of our industrial and civic struggles with horror, for they eclipse those of war.

Of all our crimes against life the worst is our infant mortality rate. By our most recent and most favorable *estimate* we are about one-third down the list of civilized countries that we lead by such a generous margin in wealth. Another estimates us twenty-second among the thirty-one,

and other experts in vital statistics give us other discreditable ranks. Our great wealth has not saved the lives of babies and children.

Every patriotic man and woman and all who reverence the life in a baby that has survived thru generations vanishing into ages beyond our knowledge—a trust from the infinite—knows that we should be first in the list, and that there should at least be no guessing about our rank. We are the only civilized country that does not keep official records of the birth of its citizens.

A few states and cities whose birth registration is accepted tentatively by the Bureau of the Census are required to come within only 10 per cent of the truth, while other countries are required to be within 5 per cent.

One interesting—very interesting fact in connection with infant mortality rates as related to schoolhouse keeping, and to women's responsibility for children wherever they may be in the community and responsibility for those social evils that injure babies, is this: The eleven countries where children are best cared for are the eleven where women have equal power with men in controlling governmental and social practices, thus being able to discharge their God-given responsibility. According to the international tables of vital statistics published by the Registrar-General of births, deaths and marriages in England and Wales the eleven countries with lowest

death rates of infants and children under five years of age are New Zealand, Norway, South Australia, Tasmania, Queensland, Sweden, Victoria, New South Wales, Denmark, Western Australia and Finland.

This, interpreted, means that where women are clear thinking enough to do their part, and men fair minded enough to share the world's work on equally advantageous terms, child life is safer and humanity better. In all these eleven countries some of the recognized causes of infant mortality are less. In several the use of alcoholic drinks is under very much better control than with us. Divorce statistics, the social evil and poverty are less in some; industrial conditions and education better regulated. In some health officers and other sanitary workers are much more often trained for their positions.

We have nine states now (1912) with 3,000,000 women having full citizenship's responsibility for children: Wyoming, Colorado, Utah, Idaho, Washington, California, Kansas, Arizona and Oregon. But their birth registration is not yet near enough to accuracy to be accepted even tentatively by the Bureau of the Census.

More than twice as many babies born alive die annually as people at all ages from tuberculosis. In the last ten years approximately two million babies born alive have died under one year of age. Four million children under five years

of age have died in these ten years. Of the two million babies, one-third of the deaths occurred in the first month after birth. As many more probably occurred at and just before birth; while as many deaths probably occurred during the four months before birth as in the first nine months of the first year.

These deaths before birth and within a month after are distinctly due to fathers and mothers who have not given their children enough vitality to survive. One exception to this statement would be those deaths due to murder of the child before it is born, whose number is not known, but is large. Another exception is deaths due to improper care of the new born.

After the first month deaths are more likely to be due to bad care and to wrong environment, or to accidents, or to crime. If the sanitary conditions are so poor as to cause death, in so far as health ideas and habits have been wrongly formed at school, schools are responsible—such habits as becoming accustomed to dusty, dirty, badly ventilated, overheated rooms, and so having them at home. It is a cause of death for a baby to live in a too hot room, with perhaps steam and dust, and too much clothing on.

And in so far as schools have promoted in future parents the "school diseases," anemia, nervous disorders, catarrhal and tuberculous conditions, by overheated, dusty, arid air (which will be bad

in other ways if bad in these), all which details are in the care of janitors, our infant mortality rate becomes an index of our school sanitation. It is, indeed, an index of civilization itself. If babies were well born and well cared for their death rate would be almost negligible. This means that the infant mortality rate measures the intelligence, right living and health of fathers and mothers; the standards of sanitation and morals of communities and governments; the efficiency of physicians, health boards, educators—and janitors. Our measurement we have seen is poor.

The Boston A. C. A.

The first people in this country to appreciate the importance of cleanliness of schoolhouses enough to really study it, spending money, labor, time and intelligent, even expert effort on the details, were, so far as I can learn, educated “home makers”—the Boston Branch of the Association of Collegiate Alumnæ. In this, as in so many other vital concerns of homes and schools, Mrs. Ellen H. Richards was an inspiring guide, serving as a sanitary expert from the Massachusetts Institute of Technology.

The work was organized very thoughtfully and efficiently. The cooperation was secured of the mayor, the president of the school board, superin-

tendent of schools, supervisors and teachers, chief inspector of public buildings in the state, chairman of the board of health, custodian of buildings and, besides Mrs. Richards, two other experts from the Massachusetts Institute of Technology. S. Homer Woodbridge, professor of heating and ventilation, directed the technical investigations of heating and ventilating apparatus, and of plumbing, made by paid inspectors. It was volunteer work for the good of the children—and the nation.

They systematically investigated and took notes on several hundred details. This account will review only some of those directly concerned with janitors' work as it affects health. They did not take any one's word for any housewifery that they could learn by their own personal observation. This is a very right policy, for rules are one thing, the methods of carrying them out in school housekeeping, as in one's own housekeeping, are quite another. Official replies to questionnaires are—official.

Another strong point is that they did not drop the work after making their first report. In two years, after the city had expended the special appropriations amounting to about \$400,000, as well as their regular annual appropriations for repairs, they took it up again with equal thoroughness and reported on oversights—true housekeepers' system that all municipal sanitation needs. They

found a considerable portion of the appropriations had been misspent according to amateurs' ideas, instead of according to the advice of sanitary experts—the real economy and effectiveness.

The later reviews of the ground showed some improvements following each investigation. But Boston has not yet "arrived" in the matter of clean schoolhouses. There is still more for the "natural housekeepers" who have been scientifically trained in housewifery to do there and in every other city, or our tuberculosis and infant mortality rates would not be so high. Another good result was that their work being so sensibly done inspired other branches of the Collegiate Alumnæ to study the schools in their cities in similar fashions, and their reports produced local effects of more or less value.

December

And Janitors' Rules

One of the interesting discoveries made quite generally wherever the college women undertook this study was that the requirements for cleanliness in schoolhouses, which were sometimes, as in Boston, inadequate, were not lived up to.

In Boston their report stated that while it was

provided that stairs and passageways be swept daily, and the rooms twice a week (imagine a home with a few score or hundred children swept that often), in over half the schools the halls were swept only twice a week instead of daily, in two it was done but once a week, and in one only once a month.

Entries, stairs, rails and furnishings were to be dusted every morning; but it was found that classrooms were dusted less often than once a week by eight janitors, only twice a week by eighty, daily by teachers or pupils or janitors in fifty-two schools, and daily by janitors according to the rules in only forty-three of the 193 schools studied.

There was a rule that desks, seats and wood-work be cleaned whenever necessary. Twenty-one janitors thought it was never necessary and had never done it; twenty-four had done it once; fifteen had done it rarely; twenty-one did it occasionally; twelve, twice a year; ten, oftener, while in sixty schools all such cleaning was done in the long vacations.

Janitors' standards of housekeeping set more home standards and habits of cleanliness and healthful living thruout the country than any other one agency. It is chiefly violation of laws of cleanliness and health in schools, at home and in the community that kills children of any age. These housekeepers whose studies we are dis-

cussing, and who found that even poor rules (such as no good housekeeper would have) were not lived up to, had and have no power to use their housekeeping ability on this important problem for the good of the state that educated them. This is foolish economics.

There were no rules (1895) requiring floors to be washt. From 9 to 50 years the floors had not been washt in 77 buildings! They were washt seldom in 12 buildings; once a year in 15; twice a year in 18; three times a year in 8; oftener than three times a year in 5. They were all floors so finisht as to permit washing—and invite it. Washing, as we have seen in *Clean School-houses*, is not the best treatment of floors with certain finishes that need other care. Whatever the finish, the text heading the beginning of this subject stands.

Ten years later there were still no rules requiring floors washt, and the great majority of the floors were as one would expect. But in 1905 there was some improvement in requirements for sweeping, altho the quality of the sweeping was not held up to good housekeeping standards, and the new rules were not always obeyed. Schoolrooms not used for kindergartens, manual training, evening classes and lectures were still to be swept only twice a week; the others, daily; and all were to have fortnightly sweeping with sawdust wet with a solution of formaldehyde. The door knobs and

hand rails were to be washt twice a month with a solution of formaldehyde, and the seats and desks of all having a contagious disease were to be washt with a similar solution; all wood-work was required to be washt once or twice a year.

These rules are the record of ten years' progress on these points in school administration. They show a limited amount of interest and capacity. Their requirements from the viewpoint of efficient housekeepers are not sufficient either in quality or quantity.

The parents who in those ten years lost probably ten thousand children under ten years of age who died unnecessarily, and the parents whose living children were hindered by altho surviving the causes that helpt destroy the ten thousand should regard anything less than excellence in school housekeeping a crime against childhood, motherhood and the state. The children are helpless, and the unfranchised mothers who are housekeepers and caretakers of children by common consent. The statistics of ill health among teachers make all this quite as much a vital matter to them, all of whom are also politically powerless.

*January**Measuring dirt on windows*

Another study made by these women was of schoolhouse window cleaning. The requirement was that windows should be washt twice a year. The question they wisht to answer was whether under this rule there were any schools where dirt accumulated on the windows in sufficient quantity to diminish light to the point of injuring vision.

With a photometer they measured the amount of light entering before and after washing the windows on one side and on both sides. They arrived at interesting facts and practical conclusions.

When this committee used a photometer to measure the amount of light coming thru windows in their study of housecleaning they were helping an important step forward for children. They were measuring with an instrument of precision, instead of expressing opinions which so often differ, with every one "a right to his own"—a dangerous maxim applied to cleanliness.

We measure heat by thermometers, and that is the only accurate (when instruments are so) test of school housekeeping thus far adopted. It does not yet amount to as much as it should, for several reasons.

Very recently a teacher informed me that for four weeks an hourly record of her thermostat had been kept by the children. It never read under

72°! It was frequently 76°. It appalls one to think of the "red tape" that maintains a temperature at or above 72° to the second hour after the first has discovered it. Here were almost 140 hours—one eighth of the school year—of "laying foundations" in education and in our tuberculosis rate, with the end of the overheating not yet in sight. Her city's "Rules for Janitors" requires 70°, which is two higher than in up-to-date rules. Instruments of precision are waste of public funds if not lived up to, and if not kept accurate by occasional standardizing, as we regulate school clocks.

For studying window cleaning the schools were groupd in three classes. Those of the best class were all situated on high ground where no structures (or trees, I assume) shaded the windows. They were built according to modern ideas of maximum window area (one-fourth of floor area), with ventilating systems supplying "sufficient" pure air (30 cubic feet per minute for each person), and with the proper number of pupils in each room (forty-five).

The buildings of the worst class were located where there was a great deal of smoke, dust and other impurities in the air. They were surrounded by tall buildings and by alleys not more than twenty feet wide. They were old, with insufficient window area, practically no ventilating systems, and gaslight was frequently used in the daytime.

Even today city authorities sometimes erect new buildings near walls, or allow walls to be placed so close that gaslight is needed in the day schools. Since fathers (the politicians) will do this, mothers owe it to their children to make matters better.

The buildings of the intermediate class were surrounded by streets of medium width, and buildings whose height averaged less than the height of the school building, on one side perhaps higher, on the other much lower. Their window area was somewhat less than it should be; the ventilation "fair" (a matter of opinion, I suppose); smoke and other impurities in the air of the neighborhood were "present in average quantities."

The tests were made on dull, overcast days when the intensity of light was quite constant. The poor light of such days must be provided against in schoolhouse construction. They measured the light in rooms with different exposures in each building, before the windows were washed, after washing them on the inside, and after washing them on both sides.

In the best buildings they found that the light was about 4 per cent stronger after washing windows on the inside; and after washing them on both sides it was about 2 per cent better than that. It varied a little of course between different rooms.

In the worst buildings they found that before washing the windows the light measured one-

twelfth to one-nineteenth as much as that in the best buildings. It gained 21 per cent, or thereabouts, after washing on the inside, and gained about 6 per cent more after washing on both sides. One room gained 33.3 per cent after the windows were washt on both sides.

Try to follow in imagination the logical steps from the compulsory law taking children away from their parents into rooms with one-fifth to one-third of the light cut off by dirt on windows which at their best give only one-tenth to one-seventeenth the amount of light thought by experts to be desirable for the best buildings; follow on in thought to the listlessness, headaches, loss of grades—"backwardness"—that we discuss in *Prevention of School Fatigue*; and then on to perhaps the career of "Weary Willies" or worse, or to useful citizens forever hampered morally and mentally by imperfect vision, unless they happen to discover that they need glasses. No one wants to spend money on glasses or to be bothered with them even when old age is a legitimate reason. There is also the fact that good light is essential for general health, including health of the nervous system.

The intensity of light before washing windows in the intermediate class of buildings measured about one-half that in the best group, and gained more than twice as much as they gained after washing on the inside, and nearly twice as much

after washing on both sides. That is, the windows of the intermediate and worst classes were much dirtier both outside and inside, needing washing oftener.

Their measurements showed also that in the same building some rooms must have their windows washed oftener than others to maintain sufficient illumination for reading without eye-strain. It is with windows as with management of children, "wholesale" rules treating all of a group alike, do not produce the results we are after.

In the best class dirt does not accumulate on windows enough to make the reduction of light of any importance. Yet, because they are "prominent" buildings, they almost always have more and better janitor service.

It was found that the inside cleaning makes a much greater improvement than the outside cleaning, particularly in buildings with poor ventilation. The moisture and organic material given off from children, with the dust of the rooms and impurities of city air, make a deposit on walls and windows. This helps to create smells as well as to diminish light. A good ventilating system would have sufficient air currents to sweep some of this out of doors, if windows and flues were used effectively.

They could not remove all, for even out of doors in smoky districts, as the coke burning regions

of Pennsylvania, or as in large manufacturing cities, vegetation is covered with a deposit that frequently rain does not wash off. This, with the sulphuric acid in smoky air, prevents or greatly hinders school gardens, home gardens, and the beauties of field and forest. In London they are studying how to save the stones of which Westminster Cathedral is built from this destructive action whose effects are already serious. Just where people and children come in is another story.

In schoolrooms where the deposit can be washt from windows and scraped from walls, the conditions blight children and teachers—eventually the nation that compels or permits them. Undoubtedly such schoolroom air helps cause the discolored noduled lungs found at autopsies which are spoken of in another connection. Since in the open air this unwholesomeness exists, evidently to establish good school ventilation is not the whole problem. Another step is to enact and enforce legislation compelling captains of industries to cease contaminating the atmosphere with smoke and other impurities that damage public health quite as definitely as allowing sewage to escape into the common water supply.

Two weeks after all the windows had been washt on both sides the light was measured again. It was found that windows in the intermediate class had grown three times dirtier than

those in the best; while windows in the worst class had grown six times dirtier. Should this suggest a rule that janitors wash windows in the dirtiest, darkest rooms six times oftener than in the brightest and best ventilated, and three times oftener in the average rooms?

February

And "dipping"

In Boston at that time it cost over \$11,000 to wash all the windows twice a year, this investigating committee reported. It must cost more now. This expense for light reminds me of Mark Twain's "Truth is the most precious thing in the world, and therefore we must be very economical in the use of it." We have been economizing in both kinds of "precious" light—physical light as well as mental light.

Should windows acquiring a certain amount of dirt, say six times more quickly than others, be washt six times oftener? This means six times the cost to the city, or some other proportion that would annually amount to several thousand dollars in the larger cities.

To answer yes would be in accordance with the philosophy of political administration in numerous

directions. For example, we derive an income ("license fees") from the sale of intoxicants which we spend many times over in "curing," "preventing," "punishing" the logical results. We allow "red light" neighborhoods and unsanitary housing conditions yielding good percentage on the investment (or they would not flourish so generally), and we spend the resulting income, taxes, fines, hush monies, for reformatories, police, courts, lawyers and judges. I speak only of the financial waste in these illustrations of many similar foolishnesses, leaving human waste to recollection and to study of the volumes of the Census.

There is a story going of a test for feeble-mindedness used in a hospital: After turning on the water in a bathtub, the patient is given a dipper and told to empty it. Those who are sufficiently intelligent begin by shutting off the water, the others only dip.

We desperately need intelligence equal to finding out and shutting off the cause of the wrongs, immorality and ill health we are trying to get rid of by merely dipping. Spending money on extra window washings would be merely dipping, for these women studying conditions had found out that bad ventilation, befouled city atmosphere, over-crowding and bad building were the cause of the bad illumination, as well as of other serious menaces to health.

That politicians neglect the sanitation of schools

is no excuse for mothers doing so. Society insists that they are the caretakers of children. The Creator holds them so with his laws of birth, life and death. Housekeeping belongs to woman—and she shirks.

Here is the result of the shirking by women in Michigan. The State Board of Health has recently published some facts from a study of tuberculosis among teachers. Michigan ought to be one of our healthiest states, with no great cities and their abnormal crowding to depreciate vital statistics.

Of the deaths between twenty-five and thirty-four years of age among all people in Michigan during certain years, one quarter (25.8 per cent) was due to tuberculosis; but among teachers it was over one-half (52.4 per cent). Among all ages only one-eleventh (9.4 per cent) of the general death rate was due to tuberculosis, but among teachers the rate was three times greater (27.6 per cent).

It is probably as bad if not worse in each state where there is a mothers' club and teachers' association, for the Michigan figures reflect the statistics of the Bureau of the Census for the whole country concerning teachers and tuberculosis. The same conditions that invite it in teachers invite it in their pupils. Teachers (mostly women) and mothers are as helpless to control this sort of housekeeping as are the children.

They are all clast together politically, as idiots, minors, women, criminals, etc., and yet the state has put millions of dollars into the education of these teachers and mothers whom it refuses authority in their own special business, care of children and housewifery.

Janitors wholly untrained in sanitary house-keeping, supervisors and politicians also untrained, make these conditions inviting disease and death for those who are at their mercy politically and legally. Why? Because so many women are willing to let it be so. That is the chief reason.

The standards of mothers have not kept pace with the needs of the century. The good mothers of one hundred or two hundred years ago understood their duties more in accordance with the needs of children, especially with that need for mothers' protection as well as fathers' in *all* the interests of youth.

The old house with fertile acres around it—"home"—furnisht food, shelter, work, recreation, education, under the supervision of the mother quite as much as of the father. There were weak points, but not those requiring juvenile and divorce courts, organized charities and regiments of social workers. These new institutions betray the weaknesses in mothers and fathers—children's needs are the same. I am reminded of a protesting mother: "Oh, Doctor, castor oil is such an old-fashioned thing for the baby!" "And,

Madam, babies are very old-fashioned things, too."

Youth needs, and has a right to it to-day exactly as of old, mothers' as well as fathers' control of their work-places, whether factory, shop, office; of their place of education and places of entertainment, whether theatre, show or rink; and of their comings and goings between these interests, the city streets—formerly all a part of home.

The house for eating, sleeping and waiting for school hours, work hours, outside fun, does not correspond to the original conception of home, which was "village" or "estate" (on which villages would be). Webster gives this meaning as obsolete, and gives the first modern synonym of home, "tenement." With tenements for homes ("the mothers' place") have come juvenile courts and all the other methods of "dipping."

We must restore the true conception of home, the house and *its sustaining environment all under mothers' as well as fathers' control for the good of the children*. The twentieth century city is the twentieth century home. Its details affect children after the same old-fashioned laws. Mothers are as essential as fathers in managing homes.

Since motherhood implies nourishing and protecting after birth, mothers even more than fathers are responsible for allowing caretakers to maintain school conditions injurious to children's and teachers' health to the extent that

statistics show existing and also show preventable. That men are not doing well this ages long woman's work of housekeeping, home making, care of children, willing tho they are to shoulder it all, is because they cannot today any more than in the days when mothers willingly attended to it. Between the woman's shirking and the man's inability pupils and teachers are helpless in their rôles inviting tuberculosis, infant mortality, and other vital rates disgracing us among the peoples of the world.

In addition to this study of lighting and of removal of dirt and dust made by the Boston women, they had studies also made of school dust bacteria. Only occasional contagious disease germs are found in dust, as we have already learned, drying and light killing most of these bacteria very soon. Pus forming germs however are in great abundance. Their studies of dust were chiefly valuable as suggesting the amount of dirt. They found that after sweeping with damp sawdust, the numbers of micro-organisms were very little reduced, except as the quantity of dust removed carried them with it; but when the sawdust was moistened with a solution of formaldehyde nearly all bacteria were destroyed in cultures made from the floor dust immediately after.

They investigated oil dust layers, the kerosene dustless broom of which we have spoken, and

vacuum cleaning; door mats and shoe brushes. They measured air currents in ventilating shafts with an anemometer, another pioneer use of an instrument of precision in school sanitation. In sixteen buildings they found the ventilating shaft ended in the attic, which in some cases was kept closed, or it connected with the outer air only thru ventilators in the roof. In some cases the ventilating shafts from water-closets and from classrooms ended out of doors at the same point, so that when there was a back draft into the room, perhaps caused by the wind, it carried with it the foul air from sanitariums. They re-discovered 126 schools whose sanitariums had been repeatedly condemned by the city board of health, with recommendations that they be abolished.

They investigated playgrounds, also, and among various items found 136 with 346 cesspools, 9 cesspools having no sewer connection, 29 being for sewage, the others for surface water; all were cleaned very irregularly, only 7 as often as twice a year, and 10 schools reported they were never cleaned.

They investigated fire escapes and found equally reckless indifference to the safety of children. But these are "other stories," not janitors' work. They are significant of what awaits mothers who look out for their children's welfare, for conditions corresponding to these are found wherever any sanitary study has been undertaken.

They had an exhibit showing local conditions, data collected from other cities, standards of sanitation, apparatus and methods, with many more items. It was an extremely interesting occasion, instructive and stimulating as well; the first and thus far the only school housecleaning exhibit in the country. Mothers' clubs with the assistance of capable workers can render a very great service that is waiting for some one to perform in their community, if they make honest studies of school cleanliness and bring them to public attention.

The State Commissioner of Health of Pennsylvania inspected 3,572 country schools during this last school year (1911-1912), and reports only 536 in a sanitary condition. There are 3,036—more than five-sixths of the inspected schools—pronounced unsanitary. Mothers are all around each of these schools sending their children to them—and doing nothing about these things. If they were doing what they should, and doing it earnestly, the unsanitary conditions certainly would not have waited to be discovered by an official investigator from outside the community. Other equally serious reports of the sanitary conditions of other groups of schools are to be found in the annual reports of the Commissioner for 1907, 1908, 1909, and in 1910 when published. The schools in Pennsylvania are no worse than in other states. Pennsylvania has the advantage of a Department

of Health that understands this is one of the most fundamental matters in public health work.

March

Another study of schoolrooms

This persistent and intelligent study by college women in Boston, and their frank admission that Boston's methods were especially poor as compared with the methods officially reported in several hundred schools in a score of large cities stimulated, as already said, similar studies within those ten years. With no exception thruout the country the ignorance and indifference of officials and parents concerning children's sanitary surroundings at school were confirmed.

"Officially reported"—reports on cleanliness and sanitation, like reports on classwork and finances, unless details are standardized by accurate measurements and records, are of little value. We have seen that official rules are not lived up to, a fact that official reports do not make known, except official reports of medical inspectors and nurses, of health officials and our Bureau of the Census, all of which tell us sad facts of preventable ill health and death among school children.

Regular observations, measurements and records are the only reliable basis for school sanitation, standardizing physical conditions as we are beginning to standardize mental acquirements, and have long standardized details involving money interests. It is in this direction, measuring sanitary details by instruments of precision and keeping records, that we are now growing.

A study was recently made of a large school in the neighborhood of a great university from which this kind of wisdom is at last beginning to overflow. It was made by one of the students in its college of education. There are universities without enough such wisdom to overflow, if one may judge from the conditions of schoolhouses in their shadow. There is always at hand abundance of "clinical material" in school sanitation for every institution training teachers. Mothers' clubs must ask them, and must keep on asking them until the results wanted are secured, for it does them good, as well as the unsanitary schools, when they come out of their laboratories and round tables and do real things, adapting scientific and theoretic studies to the needs of the community that sustains them.

This study began with grounds and buildings, and among other things found that trees shaded the windows cutting off necessary illumination, and that the school was directly in the path of

the prevailing wind bringing disagreeable odors from a gas plant. No shrewd citizen would build even a little \$5,000 home for himself and children in such a location, nor permit the erection of a gas plant to become a nuisance. But for many years those citizens had thought it good enough for children and teachers—helpless to escape and disciplined for complaining.

Many details of heating and ventilating were bad. One discovery was literally amazing. There was found an unknown “aspirating chimney”. Years before, in renewing the heating apparatus, flues for the outlet of foul air had been opened from each room into a central chimney, and a small stove placed in the basement at the bottom of the chimney.

The heat from the stove sweeping up thru such a chimney to escape at the top sucks air from the rooms, carrying off some bad air, drawing heat into the rooms from registers, and creating air currents that make rooms much more comfortable. The principal and janitor, and the unsalaried school officials knew nothing of this good help to ventilation which taxpayers’ money had provided, there had never been a fire in the stove, and what the teachers and children endured will be learned when the measurements are told.

There was absolutely no reasonable excuse for this neglect. It was biologicly criminal; but civil laws do not make it so, as they do not make

many other slow injuries of children with bad air. They are just beginning to take up the slow poisonings of workers by phosphorus and lead in certain occupations. After a while the children's turn will come, perhaps not today's children in which some of us are interested; they will go the way of the others, taking chances with tuberculosis, anemia and all the rest. The as yet unborn children that survive to school days will have good housekeeping at school, if mothers say so, and stick to it.

A member of a mothers' club that is working on school housecleaning matters tells me that they also have found the same kind of unused ventilating chimney in one of their schools. We may justly blame principals, janitors and other city officials; but in the end, however, it is the indifference, and negligence of fathers and mothers, especially mothers, and most especially organized mothers in these two cities, for one is in the state of New York where women have tax-paying and school suffrage; while the other is in Massachusetts where women have school suffrage. That the New York condition was discovered and promptly remedied was due to a university student—not to the interested mother of any pupil in the school; the Massachusetts flue is waiting for something to turn up.

An anemometer is a little wheel so constructed as to whirl in currents of air. There is a scale

to measure the rate of whirling, that is, the strength of the current of air. This student found that the anemometer did not turn in any of the foul air flues—there was no air going out. Any ventilating flue can be tested by an anemometer. It does not cost much, and any club can provide one for the use of its schools.

School officials are quite apt to point out their flues for ventilation, and quite as apt not to know whether there are any air currents or sufficient air currents passing thru them. The currents may be by accident inward instead of outward. This was sometimes the case in a certain very expensive "system of ventilation" that was installed in many schools a few years ago. The system ventilated the water-closets and rooms thru the same or connecting flues, and when things were not just right down below or up above the current blew into the rooms instead of out!

That system is gone by, and we are spending more hundreds of thousands on others that require windows to be "hermetically sealed." But we are getting around that by all teachers in a building agreeing to open their windows at exactly the same moment every hour for five minutes, all flushing out their rooms together (thus not upsetting the direction of air currents in the "system" to the disadvantage of certain rooms)—flushing with the kind of air we were given to breathe all the time.

This is one step in advance. Open air rooms is another. The "just as good" air reminds one of the patent medicines that people pay many times more for than they would pay for the same drugs put up by the pharmacist, and that are claimed to be "just as good" as the real thing which they often are not.

A very expensive instrument, requiring delicate handling, was used to measure the carbon dioxid in the air of these rooms, the Pettersson-Palmqvist apparatus. When school opened there was the proper amount of carbon dioxid in the air, 4 parts of the gas in 10,000 parts of air, as out of doors. Several measurements at different hours showed that it increast very rapidly, in a few minutes being 10 parts, instead of 4, and growing until it was 20 or 24 or even 29 parts. Different rooms measured differently. These high tests mean that pupils breathed nearly all day what is called "very bad air" technically by engineers. It is not the carbon dioxid that does the harm; but it is the conditions that so much carbon dioxid means.

One thing it shows is that there are no air currents blowing out stale air and blowing in fresh. All the air breathed, or at least very much of it, lies stagnant to be breathed again. That accounts for the bad smells in all such rooms, odors from the breath, mouth, clothing and bodies. We do not yet know all about the effects of this rebreathed air on children during school years.

Professor C.-E. A. Winslow, in *Proceedings of the National Education Association*, 1911, which the public library or some teacher has in every community, tells of experiments proving the untruth of the old idea that carbon dioxid is poisonous in our rooms; proving that it never can accumulate in an ordinary room in sufficient quantity to do harm. Experiments were tried where the gas was sixty times more than in outside air, but so long as the chamber was cool there was no discomfort, and the people experimented on continued with their work.

When the temperature got up in the seventies and eighties, where it very often is in our schools, then the discomfort was great, being shown by flusht and perspiring faces and great restlessness. When the electric fan was started, blowing over and cooling them, they were at once comfortable again altho the air was just as hot and contained just as much carbon dioxid and other products of breathing. They continued their work for several days under these conditions, but it is not proved that children could grow into healthy adults with that kind of atmosphere. It is proved by these and other experiments that the high temperatures and stagnant air in our schools have much to do with ill health and discomfort; that it is not the carbon dioxid, but the conditions that it indicates that are harmful.

Disease germs that have gained entrance to the

body are destroyed by protective cells in the blood, phagocytes, and in other ways. The healthier the child, the more of the phagocytes. One of the chief functions of the skin and of the mucous membrane lining nose, throat and bronchial tubes, is to prevent germs getting in. When these defenders are relaxed (flushed and perspiring) in temperatures of 70° to 85°, as in schoolrooms, two dangers result; the vital processes inside the body controlling phagocytes are lessened because so much of the blood is in the skin, and the tonic contraction of the skin for protective purposes is diminished.

The skin toned up by the morning dash of cold water, by cool rooms and by exercise helps much to prevent ill health and disease. Flabby, easily chilled because of "coddling" in warmth, it is a part of the "softness" dreaded by every thoroughbred English boy. "Am I *soft*, Mother?" fell from the roof of the garden house. Keener dismay never rang in any voice of nine. Mother, after due reflection on the serious question, sent up a reassuring "No, Jack"—and the tension was relieved.

There are always more germs of contagious diseases in a roomful of people. The warmer the room, the less their resistance for the reasons we have given. It is most important, therefore, that schoolrooms be kept scrupulously clean and at the safer temperature of the 60's, for these

reasons as well as because the brain works easier and better with its due supply of blood not diverted to the skin. Some teachers have their rooms disconnected from the heating apparatus, so that they can use their windows as they please, getting all the heat they need from corridors. The pupils become restless and indifferent when by accident registers are left open. Their red cheeks and bright eager faces during school hours is a lesson to housekeepers.

A few days ago I was on the Twentieth Century Limited from Boston to Albany, the kind of train where one pays extra fare for elegance or comfort, I have never been sure which. On this occasion the heat was stifling. I consulted a thermometer—as we usually do not find one, probably that is one of the reasons for extra fare—and found it 74°. Summoning my courage and the fact, I protested to the Pullman porter. He started an electric fan in my direction, and I was comfortable, altho with scruples against being so for the temperature of the air was no lower and it was no “fresher.” But I was entirely comfortable until he stopt the fan about quarter of an hour before my station when the air seemed worse than before.

April

Measuring health conditions

We are surrounded by what some one has called an "aerial blanket"—the layer of air next the skin warmed and moistened by heat and evaporation from it. The longer the blanket lies there the warmer and moister it becomes, nearing the temperature of the body (98.8°) which is "hot weather." The warmer the body and its aerial blanket become, the more the body perspires, as that is one way its temperature is kept down, the evaporation of perspiration cooling the body. But if the air is already moist so that perspiration does not dry off quickly the aerial blanket becomes almost as moist as the skin. The blanket being as warm and moist as the skin, the heat continually being produced in the body accumulates, the blood vessels of the skin dilate that more cooling may go on thru the skin, leaving the heart and brain with much less blood, therefore their work is much harder, and all the processes of life become more difficult; sometimes a person faints for this reason. But fainting is extreme. The usual result of hot rooms is to make work more exhausting, the action of heart and brain being more difficult because the blood is in the skin to keep the temperature from fever conditions.

On a hot damp breezeless day in August we are uncomfortable for the same reason. The blanket may become warmer and moister than the skin,

with no wind to blow it off and to bring a fresher blanket. We use fans instead, and avoid heavy mental work.

The skin is the great temperature regulator of the body, eliminating waste with its perspiration, and keeping its sense of touch in working order, which means keeping a large part—a very large part of the nervous system “fit,” as is realized when one recalls the “lacelike model” in *Prevention of School Fatigue*. The nervous system controls our general health, so that the skin and its functions are very important for an efficient life.

As the nerve endings in the eyes need light waves in order that eyes may see, and in the ears need sound waves in order to hear, so, we are finding out, the nerve endings in the skin need motion waves—air motion, and many other kinds—in order to keep in health. Without motion of many kinds to stimulate its nerve endings, it loses its vitality and so affects the health, as, without light, eyes lose power of vision, and as ears must have sounds to keep in normal condition.

A child rolling on the brown bed of needles under Adirondack pines watcht thru summer days the rippling waves of heat rising from the lawn sloping toward the sun, and made a little “theory of what life is”—that it is motion, of many kinds but always motion; the motion of wind, water, heat, light, sound, electricity and finally, motion

in protoplasm and all living things, for in the country school the children had these every day events because they are so much more fascinating than story telling. Finally protoplasm, the theory had it, in a universe of motion, living by its own chemical motions resulting in energies, muscular, mental and others.

The little theory that the same phenomenon has started in other young minds was elaborated into the child's teens, when it disappeared in subconsciousness, which means it was forgotten. The child was not so far out of the way it seems, now that we find motion in schoolroom air is as important as cool temperature and sufficient humidity. The object of ventilation being to make house air like outdoor air, we must supply in it this bombardment of tiny waves of all sorts of energies coming from infinite space, to keep the sensory and other functions in health. All this motion of open air is so diminisht by walls that feelings stagnate, vitality is lessened, and therefore it must be supplied or restored; hence electric fans and other devices to keep air in motion, as well as devices for right temperatures and humidity.

The question may yet arise whether fan waves are "just as good" as outdoor waves; and whether there are still other qualities in open air needed for indoor air and health. Dr. Leonard Hill has an interesting article on "Stuffy Rooms"

in *Popular Science Monthly*, October, 1912, explaining the reasons for cool rooms with sufficient humidity and motion in the air. We are not sure of any "system" in the long run. We are entirely sure of open air. We should not pay for systems with children's lives, when "the real thing" can be had—and so much else besides—by opening windows or going out of doors.

In the school building which the university student examined he measured the humidity with a "whirling wet-dry bulb thermometer," something mothers can supply for their children's school as a Christmas present, or valentine; something we shall possibly use in our homes as commonly as the ordinary dry bulb thermometer. Another name for it is hygrometer, because it measures the moisture in the air. There are several kinds of hygrometers, this being the one used and recommended by the United States Weather Bureau.

It consists of two thermometers fastened to a handle, one bulb wrapt with a wet cloth. After whirling them by the handle for a few minutes they are read. The dry bulb thermometer reads as before, the temperature of the room; the evaporation from the cloth has cooled the other, so that it reads lower, according to the amount of evaporation that has taken place, which depends on the amount of humidity already in the air. The difference between the two readings on a

basis of the dry bulb reading is compared with tables issued by the Weather Bureau (Bulletin No. 235), and gives the "relative humidity" that we are wishing to regulate in living rooms for health's sake.

The student found the relative humidity in the schoolrooms tested (on rainy days when it would be supposed to be high) was from 20 to 30 per cent. This means that the air breathed by the children held only one-fifth (20 per cent) of what it could hold at that same temperature. This is said to be worse than any desert where vegetation never grows. Our schools all over the country with few exceptions are as arid as this in the cold months when artificial heat is used and direct open air is shut out. The normal relative humidity of open air at a temperature between 50° and 70° is about 60 per cent.

The parcht air irritates respiratory passages in its excessive demand for moisture. This helps produce catarrh of nose, throat and bronchial tubes, thus putting their mucous membrane linings in the right condition, helpt on by school dust, for growth of various sorts of micro-organisms, such as pus cells and tubercle bacilli. It probably injures in other ways not well understood.

If any of these children should undertake that most delightful and profitable occupation, school gardening, and should go for their seeds to the

shop I visited this morning, they would be quite probably served by the same clerk. He appears in an advanced stage of tuberculosis, dispensing its seeds gratis to the crowd of customers. He would cough in the children's faces as he coughed in mine a score of times. The tubercle bacilli on the fine invisible droplets that always fly from the mouth in sneezing, coughing and energetic speaking would be breathed and swallowed by the children already prepared to "take" them by badly ventilated schoolrooms. This is part of our unsystematic and shortsighted campaign against tuberculosis that is not reducing its death rate any faster, sometimes not as fast as the general death rate is diminishing. It is "penny wise" to care for a few already tuberculous, and "pound foolish" to continue practices lessening the resistance of children, particularly in the schools—the most profoundly influential of any government's institutions.

This mouth spray or shower of droplets is carried by air currents in every direction around a person for distances of even ten or fifteen feet. Some people scatter it more than others. It usually settles to the floor in ten or twenty minutes. The shower is so thin, and for other reasons, investigators sometimes find very few, or none of the special germs for which they search. But they have found near consumptive coughers enough to prove this a matter of importance.

The danger from swallowing disease germs in fresh saliva on cups is probably greater than from this scattering in the air. There is, however, when near a person great danger of inhaling them or swallowing them from the saliva droplets either while in the air or after they have settled on food or other object near the cough or sneeze. It is imperative that children (and everyone else) cover their mouths with a handkerchief (or hand at least, which then needs washing) to catch this spray when sneezing and coughing.

Professor Winslow states that experimenters who are studying mouth droplets advise at least forty inches of space between the heads of workers in factories and offices. The heads of children in assembly and class rooms are often nearer than this. I am never in a roomful of school children without seeing many even "nice" ones coughing "all over" their neighbors.

One wonders what teachers and parents do with their opportunities for correcting the nasty habit. In a recitation on physiology and hygiene that I saw last winter in a famous school from which many preachments go out about hygiene, the boys and girls with colds (and without), with hardly three feet between their heads, coughed freely in every direction while they talked about germs on long skirts!

It would aid mightily to improve our vital statistics if mothers—the home makers—would

keep suitable school homes, and teach children to cover their mouths and turn from others when they cough, as this salesman's mother and teachers had failed to do.

The student investigator studied the lighting of the rooms, but not with a photometer as was done at Boston. He found the building well arranged for illumination. His report criticized teachers for not adjusting shades properly; criticized the dirt on windows that cut off light (see Boston measurements of how much); the plants in the windows that did the same, and the seating of children in the darkest row of seats when there were vacant seats near the windows. He tested the vision of the children and found as we always find, a large percentage defective. When children enter school probably eighty out of every hundred have perfect eyes. Four years later only about sixty-five in a hundred have them, and four years later still fewer. It is mothers and fathers who allow dirty windows to blight their children for life. No one so surely as they can put an end to these wrongs.

He found water-closets built in the middle of the house, with rooms around them; dimly lighted and with no sunshine; no heat to create currents of air for ventilating thru the top windows; deodorizers used instead of properly cleaning the closets—the odor being evident thruout

the building. This is "a first class school" in the community.

He found the common cup and towel (1910). The mouth contents on such cups have been already quoted from Professor Davison in discussing "Clean Schoolhouses." Bacteriologists who have studied the common towel used in schools, factories, railway stations, etc. have found it as bad or worse; contaminated with fecal matter and bacteria from urine and bowel, with germs of trachoma and the gonococcus, both causing blindness. Actual cases of blindness in school children and teachers have been traced to the school towel; and epidemics of "pink eye" have been due to its use. Nine states have taken action against the use of the common towel, it is stated in Public Health Bulletin No. 57, published August, 1912, by the direction of the Surgeon General; Connecticut, Massachusetts and Wisconsin by law; Indiana, Kansas, Louisiana, Missouri, South Carolina, and Washington by regulation of the State Board of Health. *The Journal of The American Medical Association* has recently (December 14, 1912) published a note that interstate quarantine regulations by the Treasury Department have just ordered the abolition of the common towel from railroad cars, steamers and other interstate vehicles and stations. It still remains for mothers to care as

much for their children in the very great majority of schools.

The student found floors with wide cracks and very dirty. He found a janitor that swept corridors during school hours, filling the whole building with fine dust, as do very many janitors. It ought to be made a legal offense on the part of the janitor, quite as much as is polluting public water supplies with sewage, or spitting on sidewalks, and on the part of every principal who permits it.

These conditions, some or all of them, reported by the student are found in every city and county in the country, probably with no exception, where there are schools. So negligent are we of children's health that many worse ones are to be found. That it is largely due to parental and public indifference is shown by the fact that many of the recommendations for greater cleanliness made as a result of the study were promptly carried out by the school authorities.

Some of these that mothers also could probably secure when necessary are given (with my parentheses), and the whole report is to be found in *The Pedagogical Seminary*, December, 1910.

1. Trim the trees in and about the school yard.
2. Put the stove at the bottom of the aspirating chimney into condition for use, and

instruct the janitor to maintain a fire therein whenever artificial heating is in use. (Why not a fire whenever the rooms are in use?)

3. Instruct the janitor and teachers to keep the outlet flues always open.
4. Have the windows thoroly cleaned, and instruct the janitor to clean them as often as necessary. (The last three words are the weak point, as the Boston study proves.)
- 5 and 6. Have intelligent management of shades, and allow no plants to reduce illumination harmfully.
7. Seat children so as to secure the best light, and those with defective vision next windows, with myopic children in the front seats.
9. Insist on proper cleaning of water-closets and urinals.
10. Have artificial lights put in toilet rooms when natural light is not enough to ensure cleanliness.
12. Install a bubble fountain and abolish the common drinking cup. (Have children make paper cups meanwhile.)
13. Inexpensive individual drying cloths, such as are used in Pullman cars, instead of common towel. (There are also individual towels of paper, to burn after using, which

are in some places cheaper than laundering towels.)

14. Renovate floors by cleaning, scraping and crack-filling; then oil. (If possible use linoleum as suggested in *Clean School-houses*.)
15. Stop all sweeping while school is in session. Have entire building swept daily after the afternoon session, and dusted daily before the morning session. (Open windows during dusting, and finish it at least half an hour before school opens; an hour would be better.) Wash entire building every Saturday. (!!)

So far, excellent. The trouble with rules and other good intentions is that they so often fall to the ground and are said to make paving stones for another existence—usually in this world. Mothers should learn well the lesson taught both here and in Boston, as everywhere else, that official rules for housekeeping are not lived up to except under intelligent oversight. This city had previously a set of Janitor's Rules that required at least cleanliness, but did not secure it. It was an accidental university man that found it out—not the responsible mother, or father, of a pupil in the school.

May

Dust again

A janitor whose salary is larger than his principal's, whose floors we let his own words describe further on, whose thermometers registered 74° and 82° when I read them and, according to the teachers, on many other occasions, argued at a meeting for discussion not long ago that it is right to clean floors while school is in session—"Why, every time a child walks across the floor the dust flies up. You can see it."

The idea of this official caretaker of children is that you have to have dust anyway, and a little more or less is of no consequence—he choosing "more." We have agreed that this is the misfortune, not the fault of janitors. It is the fault of parents and others who provide no training schools, nor qualified supervisors, nor standards up to which they must work.

What amount of dust is permissible cannot be determined by the number of sweepings—the politician's idea and the average man's. The housewife knows it depends on how thoroly the work is done. There are schools swept twice daily that even immediately after sweeping are not as dust free as others swept only twice a week.

We have here the same problem as in study of other conditions of air fit for children and teachers to live in, such as temperature, humidity and air currents. We must have a standard of dustiness

and instruments of precision to measure it, to which janitors must conform, instead of conforming to guesses and opinions. The mayor of a small town whose schools had been pronounced dirty by a committee of gentlemen claimed: "That is a matter of opinion. A supersensitive person may think conditions untidy, unclean and therefore unsanitary, which an ordinarily sensitive person may consider as relatively tidy, clean and sanitary." He is quite right. Such a reply will always defend unstandardized conditions and always carry the "political machine" with the maker.

One school committee proposes to solve the dust and dirt difficulty thru a committee of gentlemen who at unannounced times once a year with pencils and printed blanks shall inspect and record floors, walls, ceilings, windows, stoves, pipes, transoms, casings, desks, inkwells, blackboards, trimmings, wainscoting, supply lockers, cloakrooms, stairways, water-closets, lavatories, basements, general conditions, yard. Their findings are compared, the janitor markt, and dismissed, promoted, warned or otherwise treated accordingly. He is given a copy of the report. Equally as important are other details of the school atmosphere under janitors' control; and the every day dust in between annual visitations that children have endured before the janitor is "called up." Callings up rarely reform—or

how easy to make the world over! The business manager also visits periodically; but he, too, is not trained in sanitation, nor housekeeping, nor child hygiene.

The price of good housekeeping is daily and even hourly supervision, particularly where children are concerned. The best way to assure this frequent supervision and to keep certain vital details up to standards is to enlist the cooperation of children. Their help will also accomplish some other needed results.

Four years ago there were very few places, perhaps not five, but today there are more, where pupils are regularly enlisted to assist in school sanitation. Certain ones in the room are appointed to read the thermometer at each hour, or at certain hours; to keep a formal record of the readings, possibly to make a chart from hour to hour or from day to day, either on paper for permanent records, or on the blackboard for the whole room to have in sight, or both. When arrangements permit, the reader turns on or off the heat, opens or shuts ventilators or windows. The appointments are changed from time to time, so that each child can have the educational experience of the work and of the responsibility. The method has various modifications; and it is invaluable as a means of interesting and instructing our future home makers, of forming habits both of thought and of living that will persist.

Children as young as the fifth grade can learn "thermometer work" with a little oversight, perhaps younger. But the standardizing of school-room humidity probably belongs in no grade under the sixth, unless as "helpers." It is entirely possible for eighth grade children to manipulate and read this hygrometer, if taught by one who knows, to compare it with the Weather Bureau's tables, and to record and chart the results. They can also learn to alter accordingly windows, or ventilators, or pails and tanks for evaporation. I have never seen this done, but am confident we shall never "arrive" in this detail of school hygiene and home hygiene until the children take hold.

They can easily use anemometers for air currents, and joss sticks or candles for currents too slight to be detected by the instrument. These would be less frequent duties, but ideal devices for effectively teaching sanitary standards. As schools at present are arranged, the "teacher of science" would usually be the leader of the work. Mothers must insist that normal classes prepare them to do it. As for the children, they are ready. They love to have a share in school responsibilities.

In the last important detail, dustiness, an instrument or a method of precision and a standard are not so easy; or, rather, they that are have not yet been devised. The only methods of measuring dustiness that I have seen are more for the laboratory than for children in the schoolroom.

In schools where physics, or chemistry, or any biologic science has a laboratory, certain of these methods can easily become a part of pupils' work for the school. In the *American Journal of Public Health*, June, 1910, is published *The Report of the Committee on Standard Methods for the Examination of Air*, signed by C.-E. A. Winslow, Ellen H. Richards, G. A. Soper, J. Bosley Thomas, John Weinzirl, and followed by numerous references to other studies. It gives the latest best methods, some of which may be of use to teachers.

In elementary schools for the present I know of nothing better for measuring dustiness, and it is excellent, than that of a good housekeeper—a white or black cloth rubbed over surfaces to find what can be rubbed off. If dust can be, the good housewife considers the work poorly done, and it must be done over. In *Clean Schoolhouses* floors were mentioned that after certain methods of sweeping did not soil the white handkerchief past over them.

June

How to do it

There is a very much better resource than questionnaires for supplying the background of information concerning what others are doing and

thinking which is needed to develop study of local conditions effectively.

It is the Information Desk of the Public Library. It suggests an animated cyclopedia or, better, an animated switchboard, for the attendants in a few minutes connect one with the best that is written and all is thoroly up to date; health, school and other government reports; investigations by individuals and organizations; articles explaining and discussing almost any subject, scattered thru hundreds of periodicals that would take so much of one's own time to search out the task would be abandoned. It is an intellectual instead of an electric telephone service. The model Information Desk is in the Providence Public Library, under Miss Lyman, the successor of Miss Mabel Emerson—a pace-maker.

When a library has no such department, the librarian and his assistants sometimes will help to material. Possibly the card catalogue or some supplementary catalogues group topics and references in such a way as to be useful. Where this fails in a community—thanks to Mr. Carnegie, 50,000 fewer fail today than twenty-five years ago—and when a neighboring city library cannot be consulted, the publications by bureaus and departments of the Government at Washington can be had from the Government Printing Office—can be had for the asking on anything concerning the welfare of farm stock and crops and other such

interesting and valuable national assets; but to obtain information on health matters, one must buy the pamphlets.

Every library should have the annual Reports of the United States Commissioner of Education which will be of use, and the various Indexes of Periodicals and of other publications where subjects and authors are arranged for convenient following up. Most of the references in this book also contain many others, putting the reader on the right track, especially the next reference given.

No schedule of points and questions fits all places. The most helpful compilation of good questions and of good authorities to consult is probably by Dr. Guy Montrose Whipple of Cornell University, called *Questions in School Hygiene*, published by C. W. Bardeen, Syracuse, New York. Local and new questions can be arranged satisfactorily by consulting this book in the public library.

It is better to have a short schedule directly to the point, than one of so many details as to appall volunteer helpers. Those having special acquaintance with local school housekeeping, perhaps a school nurse or teacher (even if an "ex"), can help decide the really essential questions.

Possibly the shortest schedule would be: Name of school; name of room; date; temperatures (as many as can be obtained); humidity (if it can

be had); cleanliness (windows, floors, corridors, basement) and dustiness; smells (rooms, corridors, water-closets, urinals); cup; towel; washbowls.

One could hardly do less than this. One should do at least as much as this, and as much more as can be well done. On other pages other suggestions are to be found.

One of the earliest steps forward to take, and as it usually appeals to teachers it is a comparatively easy one, is to suggest the children's keeping systematic records of temperature as described on page 165. Altho the practice has grown among many schools during the last two or three years, there are hundreds of thousands of rooms that have not adopted it.

Education by memorizing and reciting has had its day. The new times call for education by doing, if the human race is to retain its capacity for doing—which is life. Parasites—those who are done *for*—are quickly done for, whether men or women. School is a part of life, not “preparation” only, and to practice pupils in standardizing details affecting health means improving our vital statistics—the measure of a nation's right living.

The charting of temperatures has many advantages. One is that more and more books, articles, reports and exhibits chart facts because it presents a more telling picture of the subject than mere words. Children will profit much

more from this new method who have grown to understand it easily by charting temperatures. The chart, especially if a standing feature of the blackboard, tells the hour's, day's, week's story to all in the room, janitor, principal, inspectors and, let us hope, to parents. It fights the battle for suitable temperature.

Thermometers should be placed, for experiment, in different parts of the room to find whether they read the same, for often different heights and different walls vary several degrees. This interesting study leads to the pupils deciding on a "fair" place for all, which may be below a gas fixture or other point of suspension in the middle of the room. Let them work it out.

A thermometer should be standardized, and the pupils should do it, perhaps every month. This is done by taking it to a place where there is an accurate thermometer, possibly a physical or chemical laboratory, or a good shop where instruments are sold or made, or to the local Weather Bureau. When the school thermometer does not read like the standard one, the pupil can learn the difference, perhaps one or two degrees, report it back to the school where the children will allow for it in the recording and charting. The accurate thermometer can be brought to the school and instruments in all the rooms standardized by it. Let the pupils do it.

Paper lined into little squares can be bought for

making charts. Even better, the children can line plain paper vertically and horizontally, acquiring resourcefulness and accuracy by doing it. Pupils will make the blackboard charts themselves—until someone patents blackboards for charting, like the children's paper cup, and school men buy them. A State Board (men) of an Industrial (reform) School for Girls illustrated the beautiful care they were taking of the girls by telling how they were planning to have all the bread making done in a regular bakery in the men's prison near by. "But—*how* will the girls learn to make it?" protested the "lady visitors." We are having a strenuous hunt for wholesome outlets for energy, pitted against the forces constraining it into factories—or idleness and mischief.

After the chart is lined, write across the top above each square the hour when the reading is taken, perhaps 9 a.m., 10 a.m., 11 a.m. (there may be no need of reading it at noon if school is dismissed), 1.30 p.m., etc. Down the sides opposite each square write the degrees from 90° perhaps to 60°. I have never happened to find a school thermometer down to 60° in this country. In England the central Board of Education has established 60° as the temperature to be required in all schools. The Americans pleading for 68° hope, backt by the demonstrations of open air schools, for something lower still eventually.

I have frequently found school thermometers in the eighties. This will never be so when the custom we are urging is adopted; nor will it be so in private homes after school children have the right idea and the right habit. All this the women of the United States can bring to pass by 1915—if they wish. Their responsibility is as infinite as the immense waste of child life is infinite loss due to their negligence. Women might wisely wage a campaign on library temperatures, also, public, college, university—always above 70°, usually at 76°, often in the 80's. The moral is—don't put teachers in public schools with university and college methods.

The charting of humidity also is necessary (see page 154) and can be done by children of the eighth and seventh grades, altho more oversight by the teacher may be called for. A mothers' club can loan or give to some or all rooms the necessary thermometers and this wet-dry bulb thermometer. The former are not expensive. The latter costs more (less than five dollars), and one will do for all the rooms in a building, being used by a handle, and not fixt to the wall. They are sometimes made to hang on the wall like a dry bulb thermometer, but for several reasons they have not proved reliable. They should hang in a strong draft if used.

The use of anemometers by children, supplied by mothers, one for a building, is also desirable;

and the simple dust test can be used, but because rather commonplace is not likely to be so appealing in a reform campaign. In this extremely important matter of dust unfranchised mothers can do little compared with those in the free states.

In the other details, the battle is almost won when the pupils keep the records. Therefore persuade the schools to this, tactfully, persistently, with every resource at command; and, when successful, follow up the innovation interestedly—just as with children at home—seeing that instruments are correct and replaced promptly when broken, and that records are preserved.

Don'ts

Don't send questionnaires.

The first great reason is because one learns very much more about school housecleaning by *being on the spot*. Questions and answers cannot cover all details, even when answers are accurate instead of "official," or instead of being warped by passing thru another person's apperception. No one believes, for example, that the Alumnæ would have received the facts they learned by personal observation if they had sent written questions of the kind they would have askt had they not seen for themselves. Many significant side details and side lights are obtained by first hand work that are important.

A second good reason for not sending questionnaires is that people are pestered with them, and two-thirds, representing so much of the senders' money and time, are thrown in waste baskets. It would take more than one person's entire time, in some instances, to reply to all that are received, beside the labor of turning one's whole stock of information upside down and inside out searching for the answers.

Questionnaires cannot in this particular case be accurate, any more than when the maid replies that she has cleaned the bathroom and one discovers on inspection that ideas of cleanliness differ. "Arm chair" school housecleaning, whether at the official end or at the questionnaire end, such as most of it in this country has been, is vanishing with the old idea that women's organizations exist for their own pastime in communities suffering for lack of their intelligent services.

Don't announce what is *going* to be done. One's own expectations as well as the public's are liable to be chilled by disappointments. Work like this can be accomplisht very much more satisfactorily when things are found as they ordinarily are and not as when "expecting company."

Don't betray that "a chiel's amang you takin' notes." Keep pencil and blank out of sight. See as much as possible without asking questions, as when one goes to kitchen or nursery to learn

how the work or the children are progressing. Schools are public nurseries for mothers' children, and a host of people are paid to keep them as safe as in the best kept homes—safer if possible.

Don't wander off to related details—seating, window area, cubic feet of air and number of pupils, fields where so many are already consuming energy. Keep to the single great neglected department in schools—housekeeping—making things as they are as wholesome as they can be made for the children, as mothers are obliged to do in their homes. "Specialize" in housekeeping. Model buildings as well as any other kind can be and they are discredited by bad care.

Don't spend time on Don'ts. Suggest, urge if best, definite, correct, practicable ideas for making details better. Be sure they are practicable and correct. Officials, like children, need constructive management.

And one more Don't: Don't exhaust energy on details that are "matters of opinion," as the mayor said, nor on details of any less consequence than *the right air* (temperature, dust, humidity, light, motion, open-air-ness) for children to live in, and *protection from fresh contagious material* on cups, towels and other furnishings. Other housekeeping improvements can follow.

First, gather some of the facts of temperature, humidity, air currents (by pupils' records if

possible), dirty floors and windows as compared with those in the home library or kitchen, and any other facts belonging here that are facts—not guesses, nor hearsay.

Second, have constructive suggestions for righting wrongs, some of which are to be found in these pages and their references.

Third, after planning systematically and doing what the mothers' club can by itself, appeal to related groups and officials to cooperate, as did the Collegiate Alumnae. Appeal persistently and vigorously when necessary, thru personal interviews, newspapers, organizations. Meet official delays, indifference, false promises, incapacity, "playing politics," with steady strong pressure—stern if necessary. This is wholly a matter for righteous indignation when so treated by any agent of government. Have an official investigating committee appointed if desired; but continue the original investigating even more vigorously—to keep them moving, and moving to hygienic conclusions rather than Democratic or Republican or personal conclusions.

Refuse all compromises that must be paid for by a child's life or injury. When mothers will not stand for the children, whom can we expect to do so?

DO IT NOW—as the November placards say of Christmas shopping—for this year more than forty thousand children of elementary school

ages (5 to 14) are dying, and millions more are being handicapt by ill health and physical defects. Very much more than half of all this can be prevented by our available knowledge, if mothers and fathers worthy to be trusted with a child's well-being really wish——

IF
MOTHERS
SAY SO

IV

PRACTICAL ASPECTS OF BIOLOGIC SCIENCE IN SCHOOL ADMINISTRATION: THE PROBLEM OF JANITOR SERVICE*

(Author's Abstract)

The factor in environment most completely under control of school authorities that most affects efficiency both in school and in later life is the schoolhouse air.

The official who has direct and continuous charge of the air is the janitor. Its details with which janitors have to deal are dust, effluvia from bodies, temperature, and humidity.

Dust is now recognized as a so universal cause of disease that the Bureau of the Census is introducing a new classification, "occupational diseases," one used by England for a century and by other foreign countries over fifty years. Dust injures more by its irritating qualities than by the pathogenic organisms it contains. Inorganic dust, such as particles of metal, or stone, by irritat-

*Read in the Department of Science Instruction and reprinted from ADDRESSES AND PROCEEDINGS, NATIONAL EDUCATION ASSOCIATION, Boston, Mass., July, 1910

ing the lining of nose, throat, bronchial tubes, and lungs, prepares these tissues for the pathologic action of micro-organisms; but micro-organisms of most communicable diseases are a form of delicate plant life easily destroyed by sunlight and drying.

The death-rate from tuberculosis is highest among workers in metal, stone, pottery, and glass. It is lowest in the country, where one cubic inch of air is said to contain normally 2,000 dust particles, while in the city it contains 3,000,000 made up of dried manure, sputum, house and shop sweepings, tobacco, ashes, smoke, iron, glass and stone particles, etc.

Dust is the commonest cause of colds in the head, sore throat, bronchitis. Wind storms in cities are directly followed by increase of such practice among physicians; and the prevalence of catarrh, to some extent of sore eyes and adenoid conditions, is directly traceable to dust in streets, public conveyances and buildings. Pus microbes are practically always present in such dust.

A nomenclature of dust diseases is growing. Pneumokoniosis is a disease of the lungs due to dust in general. Autopsies show that comparatively few city dwellers are free from it. The lung tissue is dark in color, with fibrous thickening, and nodules where more or less active inflammatory changes took place. In life this was manifest by susceptibility to "colds," by debility and

lessened resistance to tuberculosis and pneumonia. Siderosis is due to minute particles of iron; anthracosis to coal dust; silicosis to sand. House dust has more pathogenic organisms because closer to invalids, and less open to fresh air and sunshine.

There is a disease specially prevalent among those connected with public schools. But we are reluctant to admit that education has an occupational disease.

Dr. Oldright, professor of hygiene at the University of Toronto (see References), quotes statistics indicating that tuberculosis is the cause of death more often among teachers than among workers in all other fields together, i.e., the death-rate of teachers from tuberculosis is considerably above the average death-rate from tuberculosis; it is higher than in any other profession. This is in spite of the fact that women continue in teaching on an average only six years; men only nine; also that many resign before marked evidences of ill-health appear, and at the time of death may not be enumerated as teachers.

Reports in medical literature of the last fifteen years show that between one-third and one-half of school children have tuberculosis, either active or liable to become so on sufficient irritation of the air passages or depression of general health from any cause. Frequency of tuberculosis gradually surpasses that of other diseases thru school and

following years until in the prime of life it is the commonest cause of death.

These data are based on many thousand autopsies where children died from diphtheria and other causes than tuberculosis (whose existence was not suspected), on X-ray and other delicate methods of examination, and on reaction to tuberculin tests. The fact that so many frail children improve in open air schools is suggestive.

School fatigue and dullness are recognized accompaniments of the educational process; also nervous disorders.

The best cure of all these ills is life in the open. The chief factor in school life that invites them is school sanitation. This we leave to ignorant and incompetent caretakers and supervisors; who make no pretense of fitting for sanitary inspection or sanitary duties; who do the best they know with knowledge pickt up.

It is certain that if in vocational or technical or continuation or trade schools were courses for janitors and their superintendents, intelligent interest and efficiency would be secured and public health improved. Every large city has several hundred janitors of schools, apartment houses, office buildings, theaters; as well as Pullman porters, train and street-car conductors, hotel managers. We need to introduce educational and health standards in this important occupation. No good home maker has the dirty floors

and atmosphere with which we shut up children and instructors.

The Massachusetts Civil Service Commission examines applicants for janitors' places in personal record and elementary education, with a few questions on cleaning, heating, ventilating, and lighting. Engineers' licenses are required for high-pressure engines except where "policemen's safety valves" are used. The test is much less rigorous than that for other offices, the reason given being that few eligible men apply.

It is the custom to rely mainly on past service for promotion. Therefore the quality of a janitor's work depends much on the principal, as quality in domestic service has long depended on the mistress. The twentieth century is learning, and finds it hard to do so, that principalships, parenthood, and janitorships do not carry with them innate capacity for the duties; that men's and women's instincts as parents, principals, or janitors need twentieth-century scientific information for efficient care of children.

They need understanding of biologic laws and their underlying principles in physics and chemistry—subjects in which the great majority of parents, principals, and janitors are little interested, because in their schooling teachers of these sciences made them academic rather than vital, or they had no such teachers. This Department of Science Instruction holds the key to school

sanitation as to other problems of public health and morals.

A teacher of biology in the ninth grade, whose every detail is directed to stamping pupils' minds with biologic laws common to daily life, whether studied in sea-weed or bird, and who has done it so wisely for eight years that now results are coming in from former pupils justifying departure from collegiate methods, said to me, "All I adapted to everyday problems I had to do myself. We do not get in our biology courses anything about human and social biology to fit these children for living."

Fortunately this instructor had enough initiative to adjust "orthodox" training to these important demands; but this resourcefulness is not found as often as needed. If principals and others high up show little appreciation of biologic law in school management, and allow little time and equipment for biologic teaching and the necessary physics and chemistry, probably their experiences are like one of mine that is rather typical. After fifteen minutes in a classroom of thirty normal pupils vaguely discussing trap-door spiders and other "book animals," the principal justified the decision to cut down zoology one-third and give the time to English by saying, "It doesn't seem to *amount* to anything." The room had scores of flies; the neighborhood mosquitoes, tuberculosis, malaria, and infant

mortality; but these fascinatingly related topics in civic zoology are commonly neglected.

Some instructors in science create great interest by studying the immediate environment; and janitors who find "cultures" being made of halls, rooms, and basements (see References), temperatures charted day after day, and class discussions of conditions, possibilities, and methods, have become interested. Some such janitors are devising methods of floor-cleaning, dusting, and ventilating that are unique and of value. One instructor is contemplating a class for janitors this winter.

We need school data concerning dust, air currents, temperature, humidity, and other details. Science instructors are ideally situated to secure them, and better work for educating pupils in sanitation could hardly be wished. We need to establish permissible limits which shall not be exceeded; to have practical methods for testing them; to have as definite standards of sanitation as of bookwork; to train caretakers as we train engineers, nurses, librarians.

We have still lessons to learn from open air schools; and much between them and the elaborate, expensive systems at the other extreme, where air is sifted (the screens soon foul with dirt), or washt (the washings a muddy stream), heated, humidified, and sent at certain speed to rooms whose windows must not be opened, and where

out of thirty-two automatic heat regulators I found twenty-seven that "didn't work." In about 600 schoolrooms in various cities I found 210 thermometers, one-third of them out of order, and barely twenty registering within one of 70 degrees, the others ranging from 72 degrees to 85 degrees in winter months. Delicate children improve in all respects in outdoor schools where the temperature is that of even winter. Tuberculosis is cured more rapidly in cold weather than in summer. England requires the schoolroom to be 60 degrees. If this is too cold, it seems safer than ours in the seventies, with mortality statistics as they are.

Health maxims cannot offset habits that educate popular liking for overheating, and indifference to bad air and dust.

In a Cornell student's recent report on a prominent school the hygrometer determined relative humidity 24 per cent, normal being 60; the anemometer found no currents in ventilating flues; the Pettersson-Palmqvist apparatus showed carbon dioxid steadily increasing from 4 parts in 10,000 (normal) to 24 parts, i.e., the pupils breathed technically bad or very bad air thru the day.* The school, like all in that city, had printed rules for the janitor; but absence of technical training (janitor), technical standards (school

* Determination of carbon dioxid is chiefly of use to indicate stagnation of air. The dioxid is never in sufficient quantities to poison.

board), technical supervision (instructors) made rules valueless.

Methods of precision are as practicable and as necessary for caretakers of a school as for nurses in a hospital; their routine practice is entirely possible with reasonable instruction, less instruction than is given in schools for nurses and for domestic science.

References:

The Schoolroom as a Factor in Tuberculosis, Dr. William Oldright, Transactions of Second International Congress on School Hygiene, vol. II

The School Child and Tuberculosis, Dr. H. F. Stoll, Transactions of the National Association for the Study and Prevention of Tuberculosis, 1910

Annual Report of the Civil Service Commission of Massachusetts, 1907-1908

Educational Prevention, Emmeline Moore, Transactions of American Association for Study and Prevention of Infant Mortality, 1910

Our Short Course for Janitors, W. D. Frost, Addresses and Proceedings, National Education Association, 1910

V

THE TRAINING OF JANITORS IN SANITARY CARE OF SCHOOL PREMISES*

The Department of Science Instruction of the National Education Association during the recent meeting at Boston appointed a committee of three to report on suitable methods of securing sanitary care of school premises thru the training of janitors. An advisory committee of experts in sanitation is associated.

Vital statistics of tuberculosis among teachers, and data from autopsies, X-ray and tuberculin tests concerning tuberculous lesions among children are ample reasons in themselves, if there were no others as unfortunately there are, for training competent caretakers of schools, where law compels children to congregate, and where the country's health habits and health ideals are formed.

Standards of school cleanliness should equal

* Read before the Section of Municipal Health Officers, Milwaukee, September, 1910, and reprinted from *Journal of the American Public Health Association*, February, 1911.

those of the best hospitals and private homes. The factor in school environment most completely under control of school authorities that most affects efficiency both at school and in future life is schoolhouse air. The official having direct and continuous charge of the air is the janitor who has to deal with details of dust, humidity, temperature and effluvia. This responsibility is given to those who make no pretense of fitting for sanitary duties or inspection; who do the best they know how to do with pickt up knowledge.

Teachers are usually expected to report neglected details to the principal who is nominally responsible for sanitary conditions. All good housekeepers know that such matters require persistent following up of the worker. Thus the teacher must "nag" the principal and "tell on" the janitor, both usually men with no training beyond what unstandardized experience has given them. Teachers can hardly be blamed for neglecting this thankless task that creates hostility and jeopardizes their positions while probably not securing the results desired.

When janitors have the management of high pressure engines, engineer's licenses are required. A few cities have civil service examination for janitors, chiefly relating to their common education and previous experience. Massachusetts has civil service examinations that in sanitation are practically nominal, as few men eligible in other

respects apply, and there are no provisions for instruction in sanitary care of schools. In consequence the appointing of janitors from civil service lists is fallen in discredit among many school officials who find experienced janitors more satisfactory.

The training and testing of caretakers of school premises is, however, as logical and imperative a need as is that of teachers, nurses, librarians, drug clerks; or of housekeepers, cooks, and other domestic workers, rapidly coming to pass. It is a vital factor in problems of school hygiene, and is likely to be the most effective means of educating other school officers in sanitation. Salaries paid janitors in large cities, ranging from \$700 to \$2,500 and \$3,000, average higher than salaries of teachers, post-office employes, or assistant librarians, the formalities of whose appointments are well known.

Courses for janitors can be introduced in trade or technical schools, vocational or continuation schools. During the coming winter one or more biologists, possibly other science instructors also, and possibly one or more boards of health are planning experiments in talks, demonstrations, and other methods with classes of janitors.

Studies of schoolhouse air show relative humidity often nearer 20% than the normal 40-70%; temperatures are more often in the 70's and 80's than in the healthful 60's; carbon dioxid, indicat-

ing stagnant air, more often measures 20 parts in 10,000, i. e., technically bad air, than the normal 4 in 10,000; anemometers prove many ventilating flues out of order thru neglect. Dust, foul floors and air, which are the rule, are what no good home maker or hospital official would tolerate.

Meanwhile a very few schoolhouses, even in "soft coal cities," by no means the most expensive structures, have floors as clean as the home or hospital; a few others are practically free from dust; a few others have good air; a few schoolrooms have temperature at 68 degrees or below, with red cheekd pupils and teachers, who become deprest and dull in warmer air when it accidentally exists.

Such schools and schoolrooms prove the possibility of achieving each of these results even in buildings that are not equipt with elaborate and expensive heating and ventilating apparatus that forbids opening windows and is frequently out of order. Open air schools are likewise demonstrating the wholesome reaction of children to cool air of sufficient humidity and comparatively free from dust and smells. In them delicate children invariably make more rapid progress mentally as well as in health.

Among the teachers of janitors it is desirable to include instructors from schools for nurses and domestic science, as the service required is technical and practical, to be held to definite

standards which thus far have been demonstrated in these two lines of education. In addition, health officers, biologists, and instructors in physics and chemistry can be of service in creating standards and testing results. It is also important to secure the cooperation of these men and women in establishing classes for janitors on a permanent basis in the right educational institutions.

Every large city has several hundred janitors, not of schools alone, but of apartment houses, office buildings, theaters, churches and entertainment halls; also Pullman porters, train and street car conductors, hotel managers. With different grades of examination as in the United States postal service, this course can be adapted to each form of custodial care.

We are seriously afflicted by insanitary public buildings (including schools) and conveyances. The public good demands that educational and health standards be introduced in these important occupations that have been mentioned.

It is a hopeful sign that the National Education Association has taken a so evidently practical first step in school hygiene. The cooperation of health officials will encourage further undertakings.

In July, 1911, at San Francisco, a session is given to two topics: I. Assuming that schools should be not less wholesome than the best kept homes from which pupils are taken: What are

permissible limits of variation in sanitary details that may be under teachers' advisement or control (dust, temperature, odors, cleanliness, light, humidity, for example)? How are such standards determined? How are such details to be conveniently measured as heat is measured by a thermometer? II. By whom and how should janitors be trained and tested in sanitary care of school premises?

INDEX

- Adenoid conditions, 12, 97, 180
- Air, at home, 12-20, 121
 "blanket," 151-2
 city and country, 12, 67-8, 98, 180, 129, 132
 currents, 132, 144, 147.
 See Anemometer
 motion, 14, 152-4
 open. See Open air
 parcht (very dry), 13, 155
 school, 13, 21-7, 28, 32, 61, 96, 117, 121, 176, 179, 191-2
 sifted and washt, 101, 185
 See Dust, Humidity, School, Temperature, Ventilation
- American Association for Study and Prevention of Infant Mortality, 68, 187
- American Medical Association, Journal of*, 159
- American Public Health Association, Journal of*, 68, 167, 189
- Anemometer, 140, 145-6, 166, 173
- Aspirating chimney. See Ventilation
- Association of Collegiate Alumnae, 122-141, 158, 162, 174, 177
- Autopsies. See Dust
- Babies, 15, 83. See Infant mortality
- Bailey, Prof. L. H., 45
- Basements, 19, 23-26, 68, 77, 108
- Baths (internal cleanliness), 51
 kinds of, 28-32, 103
 tonic, 28-30, 42, 149
- Biologic science, 41, 59, 179-187
- Boston. See Association Collegiate Alumnae
- Boston Health - Education League, 55
- Breakfast, 42-3
- Brookline Public Baths, 31
- Carbon dioxid, 147-8, 186
- Carriers, 79, 80, 81
- Catarrh, 12. See Colds, Dust, Tuberculosis
- Ceilings. See Walls
- Chapin, Dr. C. V., 80, 81
- Charting, 128, 165-6, 170-3, 185
- Chicago, mother's letter, 96, 101
 United Charities, 94
- Churches, 105, 108
- Cigarettes, 54-5
- Civil service, 26, 115, 183, 190
- Clothing, dirty, 21, 27-30.
 See Dress

- Colds, 15, 16, 19, 180. See
 Dust, Temperature, Tu-
 berculosis
 Colleges and universities, 48,
 50, 63, 143, 173, 184
 Competition in play, 51
 Compromises, 177
 Compulsory school attend-
 ance, 11, 62, 87, 131, 144,
 189
 Conductors, street car, rail-
 way, 182, 193
 Constipation, 37-42
 Contagions. See Dust, School,
 Tuberculosis
 Cornell student's survey,
 143-162, 186-7
 Cost of cleanliness, 22, 70,
 96, 102, 134
 of janitors' work, 114
 of school plant, 98, 104-
 5
 Coughing, 49, 156-7
 Cup, the common, 79-85,
 112-3, 157, 159, 176
 paper, 82-5, 161, 172

 Dancing, 41, 51
 Davison, Prof. Alvin, 81, 113,
 159
 Dentists, 34-6
 Disease germs. See Cup,
 Dust, Towel
 Disinfectants, 23, 73, 77, 126-
 7, 139
 Domestic science. See Home
 economics
 Don'ts, 174-6
 Dress, 53, 55-8
 Dust, bronchitis and catarrh,
 composition and prev-
 alence, 67-8, 97,
 180
 committee on, 164

 Dust, contagions and
 "germs," 13, 68, 80-
 2, 139, 148-9, 159,
 176, 180
 data needed, 185
 diseases, 179-81
 feather dusters, 23, 25,
 84
 lungs (autopsies), 97,
 133, 180
 measuring and stand-
 ardizing, 163, 166-7
 pupils' co-operation,
 165, 170, 174
 removal of, 21, 23, 70,
 71-4, 89, 160, 162
 street, 96-101, 103
 See also Floors, Walls,
 Windows

 Ears. See Fatigue, Streets,
 Teeth
 Engineer's license, 183, 190
 England, 31, 35, 44, 47, 119,
 133, 179, 186
 Excursioning, 52, 59
 Exercise. See Excursioning,
 Gymnastics, Play, Vaca-
 tion
 Exhibits, 141
 Eyes, 50, 88, 91-2, 131, 152,
 158-9, 161. See Nervous
 system, Photometer

 Fathers, 59, 62-3, 78, 81, 87,
 111, 130, 138, 158, 178.
 See also Parents, Politi-
 cians
 Feet. See Dust, Shoes, Ner-
 vous system
 Floors, 16, 21, 22-4, 62, 67-
 77, 86, 125, 126-7, 139-40,
 160, 162-3

Food, 11. See Breakfast,
Constipation, Lunches,
Teeth

Formaldehyde. See Disin-
fectants

Frost, Prof. W. D., 187

Furnace, fresh air supply,
16-7, 20, 25-6, 96, 100-1

Furnishings, 16-7, 21, 96,
107, 127

Gaines, Prof. Elizabeth, 83

Games, 41, 51, 86

Gardening, 24, 41, 52, 53, 59,
76, 98, 133, 155-6

Gas, from chimneys, 102, 129,
144

light, 92, 129-30.

See Carbon dioxide

Gerhard, W. Paul, 31

Gray, H. S., 55

Gymnastics, 31, 48-52, 69

Habits. See Cigarettes, Con-
stipation, Open air, Teeth,
Sanitation

Hands, cleanliness, 79, 107

Hanger, G. W. W., 31

Hill, Dr. Leonard, "Stuffy
Rooms," 153

Home economics, 27, 41, 44,
46-7, 63, 192-3

Home, the 20th century, 137-
9

Housekeeping, 22, 27, 61, 85,
96, 103, 114, 123-4, 139,
145, 165, 176, 190

Humidity, 13, 15, 151, 154-5,
166, 173, 186, 190

Hunt, Caroline L., 45, 46

Hygrometer. See Humidity

Idleness, 53-4, 58

Infant mortality, 117-122,
124, 139, 185

Janitors and air, 122, 144

and biologic science,
179-187

and examinations,
26, 183, 193, 194

and health, 111-178

and methods, 72-5,
100, 160, 185

and politics. See
Fathers, Politi-
cians

and promotion, 183

and rules, 124-7, 142
162, 186

and salaries, 27, 65,
114, 115-6, 191

and supervision, 27,
66, 75, 162, 165,
182, 187

and training schools,
27, 114-5, 182-3,
185-7, 189, 191-3

untrained, 62-3, 114,
163, 182, 190

Johns Hopkins Medical
School Children's Hospital,
77

Kerosene, 72, 78, 90, 139

Key-word, ix, 25, 170

Kindergartens, 27, 86, 126

Kipling, Rudyard, 53

Lavatories (Urinals, Water-
closets), 23, 77-80, 87, 149,
158

Laws, 20, 57, 83, 102-3, 112,
125, 131, 133, 138, 183-4,
189

- Legal responsibility, 74, 79, 92, 127, 144-5, 160
 Libraries, 32, 45, 46, 68, 80, 81, 109, 148, 168, 173
 Light. See Eyes, Photometer, Walls, Windows
 Linoleum, 70-7, 86, 162
 Lunches, 35, 43-7, 77
 Lungs, 50. See Dust, Constipation, Gymnastics, Swimming
- McKeever, Prof. Wm. A., 55
 Michigan, Board of Health, 136
 Mothers, 12, 19, 22, 30, 39, 59, 62, 101, 111, 137-9, 145, 159-60
 Mothers' clubs and anemometers, 146, 166
 clubs and baths and swimming pools, 30-2
 clubs and boards of education, 24, 83, 114
 clubs and clean schoolhouses, 61-109, 113, 141
 clubs and curriculum, 41
 clubs and dentists, 35-6
 clubs and floors, 69-77
 clubs and home economics, 44, 47
 clubs and janitor's classes, 27
 clubs and lunches, 42-7, 77
 clubs and neglect, 24, 81, 111-4, 136, 141, 158, 160
- Mothers' clubs and open air and overheating, 20, 22, 26, 50, 95, 148
 clubs and programs, 20, 36, 45, 94, 99, 113, 141, 143, 167-74, 176-8
 clubs and *Pedagogical Seminary*, 46
 clubs and responsibility, 66, 92, 95, 119-20, 145
 clubs and school yards, 102
 clubs and social centers, 108
 clubs and streets, 99-100
 clubs and tuberculosis, 136-7. See Tuberculosis
 clubs and vacation schools and play, 58-9. See Play
- Muscular system, 57, 91.
 See Gymnastics
- National Education Association, 61, 148, 179, 183, 189, 193
 Nervous system, 12, 15, 19, 28, 33, 37, 50, 57-8, 62, 88, 91, 121, 131, 152, 182
 New York School Hygiene Association, 83
 Normal schools, 23-4, 66, 112, 166, 184
 Nurses, 15, 27, 36, 63, 114, 192
- Odors, 13, 20, 22-4, 30, 49, 62, 72, 75, 78, 106-7, 147, 158

Odors. See Baths, Clothing,
Gas, Teeth, Ventilation

Official cooperation, 122
committee, 141, 164,
177

ignorance, 63, 114,
135, 137, 142, 144,
165

management, 51, 92,
101, 104, 124, 132,
146, 176, 184

Oldright, Dr. William, 181,
187

Open air, 12, 14, 26, 51, 59,
65, 153
pollution, 133
schools, 21, 76, 93-
5, 116, 147, 172,
182, 185, 192
sleeping, 17-9

Osborne, Lucy A., 45

Packard, Dr. Mary S., 93

Parents, 11, 50-3, 54, 71, 121,
127, 142, 162, 171, 183.

See Fathers, Mothers,
Mothers' clubs

Pasteur, 90

Pedagogical Seminary, 45, 160

Pennsylvania Board of
Health, 141

Phagocytes, 149

Photometer, 128-34, 158

Play, 11, 41, 59, 108; 24, 51,
68, 102, 140, 143

Poisons and toxins, 33, 37, 51,
80, 97, 112-45

Politics, 11-12, 22, 63-4, 78,
82, 92, 99, 103, 105-7, 114,
134-6, 163-4, 177

Principals, 55, 145, 160, 171,
183, 190

Providence, 93, 168

Pullmans, 150, 182

Questionnaires, 167, 174-5

"Race suicide," 11, 62, 118-
22, 127

Reproductive system, 40, 50

Richards, Mrs. Ellen H., 122,
123, 167

Sanitation, specialists in, 27,
61, 84, 189

pupils' coopera-
tion in, 165-7,
170-4

standards, 143,
182, 186-7, 190,
192-3, 194

schedules and sur-
veys in, 22,
122-41, 142-62,
169-70, 176-7,
191-2

School boards, 12, 21, 24, 51-
2, 63, 66, 71, 82, 83,
122, 160, 186

diseases, 11, 62, 108,
116, 121, 181

expenses, 22, 70, 102,
104-5, 114, 123-4,
134, 146

fatigue, 11-59, 61, 65,
86, 91, 111, 131,
152, 182

gardens and yards, 24,
41, 76, 98, 101-2

house-cleaning, 27, 61-
109, 124-7, 192

in suburbs, 24, 76, 98,
102

- School janitors, 26-7, 111-178, 179-87, 189-94
 nurses and physicians, 13, 27, 34-6, 94, 142
 recesses, 24
 visiting, 22, 24, 25, 53
 continuation, vocational, etc., 63, 105, 182, 191
 See Dentists, Social centers, Teachers, Ventilation
- Science teachers, 166, 179, 185, 189, 193
- Shoes, 21, 56-8, 86, 96, 100
- Skin, 149, 151. See Baths
- Sleep, 11, 12, 28, 29, 54.
 See Open air
- Smoke, 55, 96, 101-3, 129, 130, 132-3. See Cigarettes
- Social centers, 104-9
- Standardizing, 115, 125, 129, 142, 163, 170, 171, 182, 185, 193-4
- Stone, Dr. Ellen A., 93
- Street dust and noise, 23, 49, 96-100. See Dust
- Superintendents, 26, 84, 98
- Surgeon-General, 159
- Swimming, 31, 32, 41, 52, 59
- Systems, 25, 26, 49, 55, 101, 129, 144, 146, 154
- Teachers, 13, 24, 27, 36, 49, 59, 66, 71, 74, 82, 88, 107, 112, 115-6, 127, 190. See Science teachers, Tuberculosis
- Teeth, 32-6. See also Odors, Ventilation
- Temperature, at home, 13, 121, 173
- Temperature, at school, 96, 117, 128-9, 148-50, 173, 186
 by feelings or thermometers, 15, 128, 171-2
 pupils' cooperation, 165-6, 170, 173, 185
- Thermometers, wet-dry bulb, See Humidity.
 See Mothers' clubs, Temperature
- Thermostats, 128, 186
- Towels, 78, 79, 159, 161, 176
- Tuberculosis, children, 21, 33, 64-5, 78, 98, 181, 189
 school disease, 78, 86, 108, 116, 121, 129, 155-6, 181-2
 teachers, 21, 64, 98, 136, 189
 See Colds, Dust, Open air
- Typhoid, 78, 79. See Towels
- U. S. Bureau of Census, 21, 22, 25, 114, 115, 119, 120, 135, 136, 139, 142, 179
 Education, 45, 79, 111, 169
 Labor, 31
 Mines, 103
 Government Printing Office, 31, 168

U. S. Weather Bureau, 154-5, 171

Vacuum cleaning, 75, 140

Ventilation, 14, 21, 23

aspirating chimneys, 144, 145, 160

systems, 25, 101, 132, 140, 146

See Anemometers, Temperature, Windows

Walls, 16-7, 21, 85-90, 132

Whipple, Dr. Guy M., 169

Wilson, H. M., 103

Windows, 16, 17, 25, 90-2, 102, 128-34, 146, 154, 158, 161, 185

Winslow, Prof. C.-E. A., 68, 148, 157, 167

Women cleaning school houses, 23

enfranchised, 66, 88, 119-20, 145, 174

guilty, 87, 111

training for house-keeping, 63

on school boards, 21

responsibility, 95, 136, 173, 175

school inspectors and supervisors, 27

See Mothers' clubs

Woodbridge, Prof. S. Homer, 123

UNIVERSITY OF CALIFORNIA
LIBRARY

Due two weeks after date.

JAN 7 1914

OCT 30 1992

SEP 30 1992

CIRCULATION

RETURN TO the circulation desk of any
University of California Library

or to the

NORTHERN REGIONAL LIBRARY FACILITY
Bldg. 400, Richmond Field Station
University of California
Richmond, CA 94804-4698

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS

- 2-month loans may be renewed by calling
(510) 642-6753
- 1-year loans may be recharged by bringing
books to NRLF
- Renewals and recharges may be made
4 days prior to due date

DUE AS STAMPED BELOW

APR 16 2004